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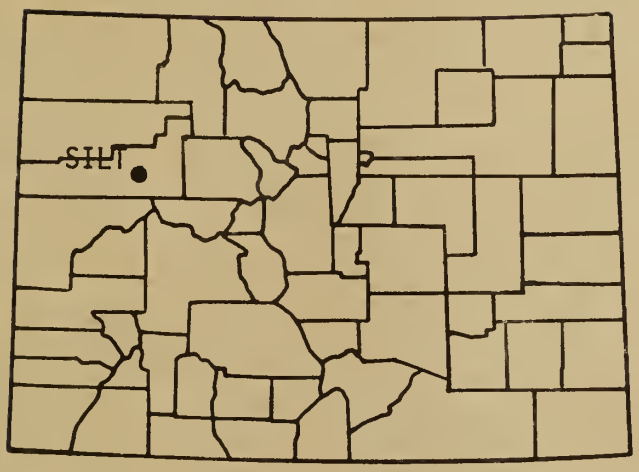
FLOOD PLAIN MANAGEMENT STUDY

TOWN OF SILT



COLORADO

Prepared by the
U.S. Department of Agriculture
Soil Conservation Service
Denver, Colorado
in cooperation with the
Colorado Water Conservation Board
Town of Silt
and Garfield County, Colorado
July 1987

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PREFACE

This report includes information on the flood hazard areas along five Colorado River Tributaries in the vicinity of Silt, Colorado.

Because of the potential flood damages, detailed flood hazard studies have been recognized as an essential item in guiding the use of flood plains. The purpose of this report is to provide adequate mapping and data for implementing flood plain management programs.

Included in the report is information on past floods, the potential for future floods, flooded area maps, water surface profiles, selected cross sections, peak discharge data, and recommendations for reducing potential flood damages.

The Soil Conservation Service conducted the technical studies and prepared the report. These services were carried out in accordance with the Plan of Work of March 1985.

The assistance and cooperation provided by the Colorado Water Conservation Board, Town of Silt and Garfield County are appreciated and gratefully acknowledged. Financial assistance provided by the Board, the town and county included funds for photogrammetric maps, and cross section data.

The survey, hydrologic, hydraulic, and other pertinent data and computations are on file with the U.S. Department of Agriculture, Soil Conservation Service, 2490 West 26th Avenue, Denver, Colorado 80217, telephone (303) 964-0295. Additional copies of this report may be obtained from the Colorado Water Conservation Board, or the Soil Conservation Service.

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FLOOD PLAIN MANAGEMENT STUDY

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COLORADO

INTRODUCTION

This flood plain management report was prepared by the U.S. Department of Agriculture, Soil Conservation Service, in cooperation with the Colorado Water Conservation Board, Town of Silt and Garfield County. Interpretations of the flood plain management study and recommendations to reduce damages are included.

Objectives

The objective of this study is to provide flood plain management information and mapping to the Town of Silt and Garfield County for use in implementing flood plain management programs which will minimize potential flood losses. Included in the report are engineering and hydrologic data which will facilitate the development of a flood plain management plan, road and bridge designs, and flood control measures (if needed).

Authority

This study was requested by the Town of Silt and Garfield County through the Colorado Water Conservation Board (CWCB). The CWCB is the state coordinator for all flood plain information studies and is responsible for setting priorities and scheduling these studies. The CWCB and the Soil Conservation Service entered into a Joint Coordination Agreement for flood hazard analyses in January 1972 (revised November 1978). The Plan of Work for the study was prepared in March, 1985.

Section 37-60-106(1)(c), Colorado Revised Statutes, authorizes the Colorado Water Conservation Board "to designate and approve storm or floodwater runoff channels or basins, and to make such designations available to legislative bodies of cities and incorporated towns, to county planning commissions, and to boards of adjustment of cities, incorporated towns, and counties of this state." The Board provides assistance to local governments in development and adoption of effective floodplain ordinances. In addition, the Board will provide technical assistance to local entities during the performance of floodplain information studies within Colorado. Presently, direct financial assistance for the performance of floodplain studies is no longer available from the board.

Section 30-28-111 C.R.S. for county governments and Section 31-23-301 C.R.S. for municipal governments of the Colorado Revised Statutes, states: The cities, incorporated towns, and counties within the study area may provide zoning regulations: "...to establish, regulate, restrict, and limit such uses on or along any storm or floodwater runoff channel or basin that has been designated and approved by the Colorado Water Conservation Board, in order to lessen or avoid the hazards to persons and damage to property resulting from the accumulation of storm or floodwaters..."

Therefore, upon official approval of this report by the Colorado Water Conservation Board, the areas described as being inundated by the 100-year flood can be designated as flood hazard areas and their use regulated accordingly by the local agencies.

Flood plain management studies are carried out by the Soil Conservation Service as an outgrowth of the recommendations in A Report by

the Task Force on Federal Flood Control Policy, House Document No. 465 (89th Congress, August 10, 1966), especially Recommendation 9(c), Regulation of Land Use, which recommended the preparation of preliminary reports for guidance in those areas where assistance is needed before a full flood plain information report can be prepared or were a full report is not scheduled.

Authority for funding flood plain management studies is provided by Section 6 of Public Law 83-566, which authorizes the U.S. Department of Agriculture to cooperate with other federal, state and local agencies to make investigations and surveys of the watersheds and rivers and other waterways as a basis for the development of coordinated programs. In carrying out flood plain management studies, the Soil Conservation Service is being responsive to Executive Order 11988, entitled "Flood Plain Management", and Executive Order 11990, entitled "Protection of Wetlands" (both effective May 24, 1977).

DESCRIPTION OF THE STUDY AREA

Basin Characteristics

This study involves five tributaries to the Colorado River totaling about 17.6 miles of stream. The tributaries are located north of the Colorado River. Their northern boundaries reach an elevation of about 7,800 feet along the Grand Hogback north of Silt. These tributaries flow in a southerly direction through the town of Silt then on to the Colorado River at an elevation of about 5,400 feet.

The topography is primarily a hogback cut by watercourses which form steep canyons. They open on to alluvial fans which provide the setting for the town of Silt.

The climate of the area is influenced by Pacific storm systems that move from west to east. The nearest national weather station, representative of the study area, is at Rifle. The mean annual temperature is 47°F with about 109 days of growing season between the spring and fall 32°F frost occurrences. The mean annual precipitation is just over 11 inches. This increases to about 12 inches at the higher elevations of the northern boundaries. Wintertime precipitation is usually in the form of snow during October to early April.

The soils include Torriorthents-Rock Outcrop at the higher elevations and Potts, Ildefonso, and Olney in the lower part of the basins. The geologic formations include sandstones of the Mesaverde along the hogback and Wasatch South of the hogback.

The higher ridges have pinyon and juniper interspersed with sagebrush. Willows and cottonwoods grow along the streams. There is a considerable amount of irrigated pasture and cropland along the middle and lower reaches of the basins.

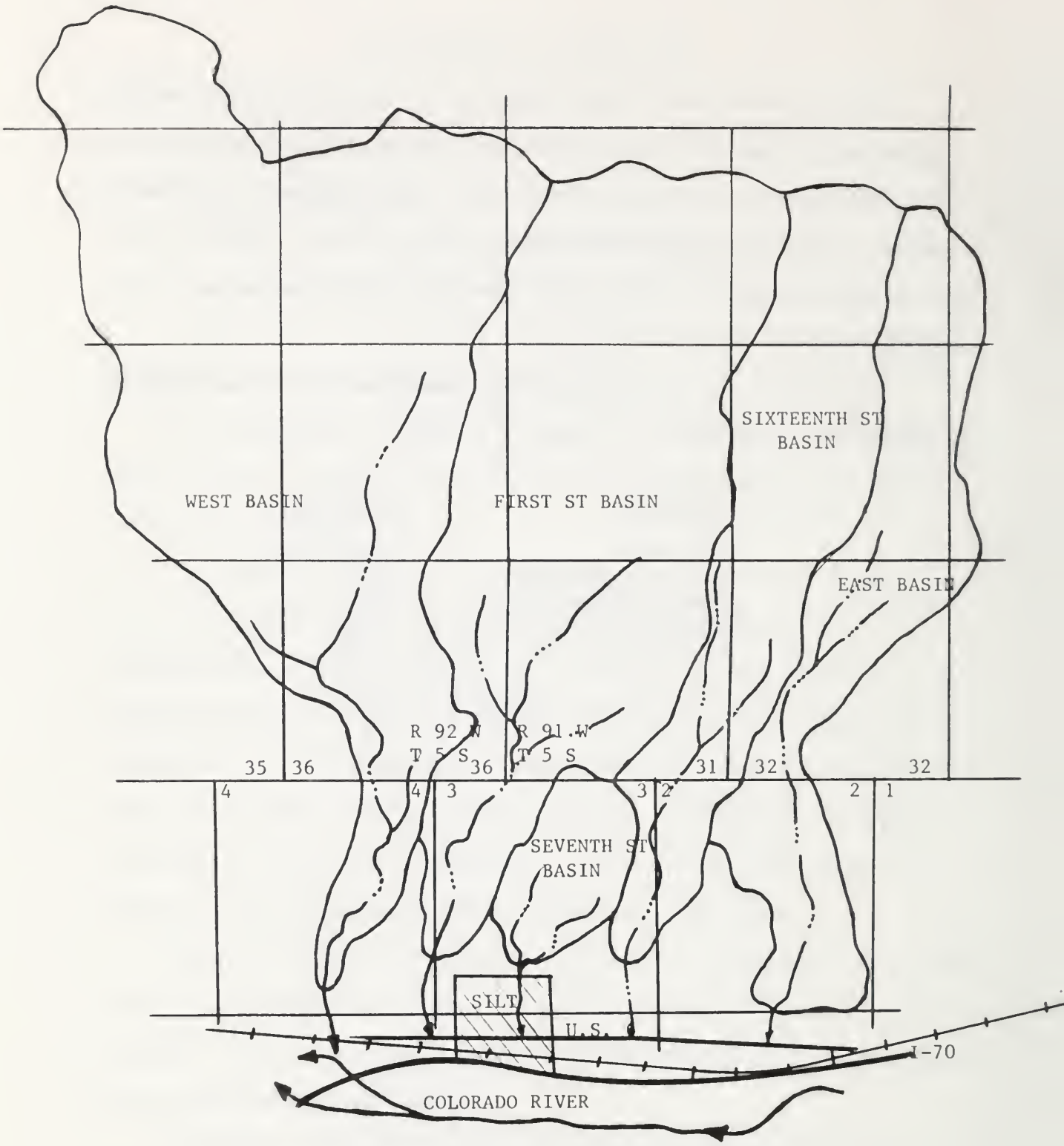
An irrigation canal (Lower Cactus Valley Ditch) flows in a westerly direction through the town of Silt. Four of the drainages studied herein are intercepted by this canal. The canal flows through an inverted siphon under the fifth tributary (West Basin).

The town of Silt is the only community in the study area.

Study Limits

The area of study includes listed stream reach distances along the following tributaries:

Tributary	Stream Reach
West Basin	4.16 miles
First Street Basin	4.21
Seventh Street Basin	1.41
Sixteenth Street Basin	3.85
East Basin	3.96
Total	17.59



DRAINAGE BASIN MAP

TOWN OF SILT

FLOOD PLAIN MANAGEMENT STUDY

Natural and beneficial Flood Plain Values

Flood plains along the various tributaries contain areas of irrigated pasture and hayland interspersed with areas of natural vegetation. The flood plain vegetation consists of a variety of forbs, grasses, sedges and rushes interspersed with cottonwoods, willows and siberian elm. The meandering channel provides an interesting diversity in landscape and vegetation. This diversity enhances the visual aestheties and wildlife habitat values in the area.

These flood plains support a variety of wildlife species such as: mule deer, coyote, cottontail, red-winged blackbird, blue herron, song sparrow, black-headed grosbeak, red-tailed hawk, golden eagle, bald eagle, Canada goose, mallard and many other species of wildlife. These reparian areas are very important in the arid regions of Colorado. The proximity to water and robust vegetation supported by the water regime attract more species of wildlife to this habitat type than any other in western Colorado.

RELATED FLOOD STUDIES

The Corps of Engineers, Sacramento District, prepared an Internal Official Memorandum Report "Flood Insurance Study Hydrology, Garfield and Mesa Counties, Colorado" dated November 1975. This was a relatively broad study that included drainage area vs. cubic feet per second per square mile envelope curves. The curves were intended for estimating peak discharges on streams in Garfield and Mesa Counties, Colorado, for flood insurance purposes.

The Corps of Engineers, Sacramento District, prepared a flood plain information report "Colorado River and Rifle, Government, and Hubbard Gulch Creeks" (Apr 1973). The Corps is currently involved in an additional study of the Colorado River Main Stem that extends beyond the limits of this 1973 study.

The Soil Conservation Service carried out a Flood Plain Management Study on Parachute Creek and Roan Creek (Aug 1985).

The Soil Conservation Service carried out a Flood Plain Management Study on 10 tributaries to the Colorado River in the vicinity of Glenwood Springs and New Castle (July 1986).

The Federal Emergency Management Agency published a flood insurance study for Garfield County, unincorporated areas (Jan 3, 1986).

FLOOD HISTORY

Minor flooding along streams in this study is caused by rapid melting of the snowpack during late May to early July. The major flood threat is from summer rainstorms. There is also the potential for flooding as a result of rainfall occurring on melting snow. The snowmelt floods are characterized by moderate peaks, large volumes, and long durations. The summer floods have characteristics of high peaks, short flow durations, and relatively small volumes.

The size of drainage area varies from Seventh Street Basin (0.38 square miles) to West Basin (4.39 square miles). The West Basin Drainage area does not include that portion above Grass Valley Reservoir Dam. It was determined that drainage into the reservoir would not contribute significantly to peak discharges below the dam for the 100-year and 500-year flood events.

There is no published history of flooding in Silt, however, field observations and interviews indicate flooding has occurred in the past.

Local residents have stated that runoff from snowmelt or summer rainstorms is intercepted by the Lower Cactus Valley Ditch. The ditch conveys this runoff to locations where the bank is low in elevation at which point overfloww occurs. Some homes immediately above the ditch, as well as properties below the ditch, receive damage due to the overflow. The north-south streets serve as a conveyance facility; however, the east-west streets cause backwater and deflect the flows laterally to other locations. The depth of flooding in most locations is shallow because of the steep topography and relatively small contributing drainage areas.

A few homes immediately below the canal have received damage from ground water seepage not directly related to flooding.

There is a potential for considerable flood damage from floods in the 50 year and 100 year magnitude. The type of flooding expected from these events would be numerous small damage sites throughout the town which would add up to major losses. Since historical flood records are not available, the following table shows the expected flood discharges for several frequencies and locations:

EXPECTED FLOOD DISCHARGES

Location	Discharge - cfs		
	10 yr.	50 yr.	100 yr.
West Basin			
At Lower Cactus V. Ditch	169	463	633
First St. Basin			
At County Rd 231	107	353	488
Seventh Street Basin			
At Orchard Avenue	6	32	53
Sixteenth Street Basin			
At Ware & Hinds Ditch	60	178	237
East Basin			
At Ware & Hinds Ditch	59	162	215

INVESTIGATIONS AND ANALYSIS

Interpretation and Use of Report

A. Frequency and Discharge

The 10-, 50-, 100-, and 500-year flood events are used as the flood frequencies for this flood plain analysis. Thus, the data developed in this report will be suitable not only for regulation purposes, and H.B. 1041 designation but also for Federal Insurance Administration flood insurance studies conducted by the Federal Emergency Management Agency.

These various flood events have an average occurrence of once in the number of years as indicated. For example, the 100-year flood occurs, on the average, once in a 100-year period, and has a one percent chance of being equaled or exceeded in any given year.

The particular uses for the various flood events in addition to those stated above are as follows:

10-Year and 50-Year Flood Events

Information regarding these lower frequency floods is especially useful for future engineering studies and land use planning purposes related to minor road systems, minor channel improvements, the location of parks and recreational facilities, agricultural lands, and appurtenant structures. The use of the lower frequencey floods may be considered in planning flood prevention projects to protect agricultural areas, or other property where risk to life is not a factor.

100-Year Flood Event

The 100-year flood event may be used in lieu of lower frequencies for engineering design purposes where greater security from structure failure is desired.

However, the most important use of the 100-year flood event lies in flood plain management and land use planning as set forth in the state statutes. The State of Colorado considers the 100-year frequency flood as the flood event to be used in designing and protecting structures and dwellings for human occupation. Therefore, all flood plain regulations are based upon the 100-year flood.

500-Year Flood Event

The 500-year flood event is useful in making the public aware that floods larger than the 100-year flood can and do occur. Just because a person is living above the 100-year flood boundary does not mean that he is completely safe from flooding. The 500-year flood event can also be used for regulating high risk developments within the flood plain such as nuclear power plants, or the storage or manufacture of toxic or explosive materials.

B. Flood Elevation

Flood crest elevations for the 10-, 50-, 100-, and 500-year floods, as determined at each cross section, may be found in Table 1 "Flood Frequency-Elevation and Discharge Data". Figures, 1 through 5, show a graphical representation of high water elevations at typical valley cross sections. Water surface elevations computed at each cross section were used to prepare flood profiles, sheets 1 through 23, which show the streambed elevation in relation to water surface elevations for the 10-, 50-, 100-, and 500-year frequency floods.

The flood profiles may be used in areas where controversy arises over the 100-year flood boundary shown on the Flood Plain Maps. Since the flood profile exhibits give the water surface elevation at a specific

point on the reference line, the flood elevations can be surveyed on the ground to alleviate any discrepancies on the base map.

C. Flooded Areas

Included flood plain maps show the boundary of the 100-year flood plain. Normally the 500-year frequency flood plain is also shown on these maps; however, shallow flow depths and the steep sloping tributaries involved in this study make it impossible in most locations to differentiate between the two frequencies on the scale of maps published in this report. The flood plain boundary was plotted from the flood profiles by determining channel stationing of flood contours at the same interval as the topographic maps. Flood contours, shown as wiggly lines, extend perpendicular to the direction of flow and intersect the ground at the edge of the flood plain.

The area included within the 100-year flood line boundry is about 370 acres for the 5 tributaries.

Hydrology

The basin characteristics suggest that summer rainfall events would pose the greatest threat to severe flooding in Silt. Snowmelt flooding is more likely to cause minor flooding. There was insufficient streamflow data of rainfall flood events to analyse, therefore the SCS TR-20 computer program was used to simulate rainfall flood peaks. The TR-20 analysis included the standard SCS Type II (24 hour) rainfall distribution and curve numbers for an average antecedent soil moisture condition (AMC-II).

The model was run for individual basins; however, adjustments were made at locations where split flow occurred or where flows combined. The discharge-frequency values from the model were reviewed to ensure the data was reasonable and then used as input to HEC-2 in the hydraulic analysis.

See the table of expected flood discharges in the flood history section for further information.

Hydraulics

The U.S. Army Engineers HEC-2 computer program was used to perform water surface profile computations. Numerous bridges and culverts exist along the channels through the study reach. Dimensions for these road crossings were determined from field investigations and the data was integrated into appropriate cross section data.

Cross section data, and reach length information were obtained from 2 foot contour topographic maps. Maps were prepared especially for this study, at a scale of 1 inch = 200 ft. with 2.0 ft contour intervals.

Hydraulic roughness coefficients (Mannings N-Values) were determined from field investigations and documented with photographs (in technical addendum). A tabulation of roughness coefficients is included in the technical addendum.

Water surface profiles, typical cross sections and maps showing the 100-year flood boundaries are shown on included exhibits and flood plain maps. Table 1 shows computed flood elevations at specific cross sections.

Flood lines were located on the maps by transferring flood elevations (at map contour intervals) from plotted profiles (from HEC-2) to the maps, using stationing along the main channel as the location reference. These points were connected and smoothed to create the map flood lines.

The Lower Cactus Valley Ditch, which passes through the Town of Silt, is a significant factor in the study. The ditch is near capacity during the summer months and therefore can contribute little in its present condition towards intercepting local runoff. Field surveys and water surface profile analyses show the carrying capacity of the ditch to be about 35-40 cfs (irrigation rights are for 50 cfs). The necessary hydraulic studies for possible enlargement of the dich, as a part of an alternative treatment plan, were made and conclusions shown in the "Structural Flood Control Measures" section of this report.

FLOOD PLAIN MANAGEMENT

Potential flood damages to existing development and possible loss of life can be alleviated or lessened through non-structural and structural flood hazard mitigation methods.

Non-structural methods include: local flood plain regulations, land treatment, flood warning and forecasting systems, flood insurance, flood proofing, flood fighting and emergency evacuations.

Local Regulations

The need to minimize property damage due to flooding has been recognized by planners and local community officials. Subdividers and developers are required to submit proposed storm drainage plans to the planning commission for approval. In the past, drainage plans have been prepared singularly or on a plat-by-plat basis. Information contained in this report will be useful in developing a master drainage plan for the study area. This report provides the outline of flood hazard areas on large scale maps specifically for this purpose.

The city may provide zoning regulations...

> ..."to establish, regulate, restrict, and limit such uses on or along any storm or floodwater runoff channel or basin, as such storm or floodwater runoff channel or basin has been designated and approved by the Colorado Water Conservation Board, in order to lessen or avoid the hazards to persons and damage to property resulting from the accumulation of storm or floodwaters"...

as stated in Section 30-28-111 for county governments and Sections 31-23-301 for municipal governments of the Colorado Revised Statutes.

Colorado Natural Hazard Area Regulations

In 1974, the Colorado General Assembly passed House Bill 1041, a bill "concerning land use, and providing for identification, designation, and administration of areas and activities of State interest,..." (H.B. 1041, Title 24, Article 65.1, CRS, as amended). Areas of State interest include natural hazard areas, or those areas that are "so adverse to past, current, or foreseeable construction or land use as to constitute a significant hazard to public health and safety or to property." Flood plains are natural hazard areas.

With reference to the administration of natural hazard areas, section 24-65.1-202(2)(a) of the Act provides: Flood plains shall be administered so as to minimize significant hazard to public health and safety or to property; open space activities shall be encouraged; structures shall be designed in terms of use and hazards; disposal sites and systems shall be protected from inundation by floodwaters; and activities shall be discouraged which, in time of flooding, would create significant hazards to public health and safety or to property.

The Act further provides that after promulgation of guidelines for land use in natural hazard areas..., the natural hazard areas shall be administered by local government in a manner which is consistent with the guidelines for land use in each of the natural hazard areas.

Colorado Water Conservation Board Designation

Concerning the designation of the flood plain, the Colorado Water Conservation Board is charged with the primary responsibility for:

1. Making recommendations to local governments and the Colorado Land Use Commission.
2. Providing technical assistance to local governments.

The Board's power and duty is ...

> ..."to devise and formulate methods, means and plans for bringing about the greater utilization of the waters of the state and prevention of flood damages therefrom, and to designate and approve storm or floodwater runoff channels or basins, and to make such designations available to legislative bodies of cities and incorporated towns, to county planning commissions, and to boards of adjustment of cities, incorporated towns, and counties of this state"...

as stated in Section 37-60-106 (1) (c) of the Colorado Revised Statutes

Upon review and approval of this report, the Colorado Water Conservation Board will designate and approve as flood plain areas those areas inundated by the 100-year flood as described by the floodwater surface elevations and profiles in this report. The use of the designated flood plain areas may then be regulated by the local government.

Model Regulations

Model flood plain regulations have been promulgated by the Colorado Water Conservation Board, with the purpose to promote public health, safety, and general welfare, and minimize flood hazards and losses. The model includes provisions designed to:

1. Promote sound planning and land use, and permit only such uses within flood plains that will not endanger life, health, and public safety or property in times of flooding.
2. Protect the public from avoidable financial expenditures for flood control projects, flood relief measures, and the repair and restoration of damaged public facilities.
3. Prevent avoidable interruption of business and commerce;
4. Minimize victimization of unwary home and land purchasers; and

5. Facilitate the administration of flood hazard areas by establishing requirements that must be met before use or development is permitted.

The Board's model flood plain regulations offer two options for management of the 100-year flood plain. These are the Hazard Area Concept and the Floodway Concept.

The Hazard Area concept defines the areas of the flood plain in which waters of the 100-year flood attain a maximum depth greater than one and one-half feet as a high hazard area , and a depth less than this as a low hazard area. The Board recommends that no basements should be allowed for structures located within the low hazard area and all habitable living quarters (first floors) should be constructed a minimum of one foot above the 100-year floodwater surface elevations. Development is prohibited in high hazard areas.

The Floodway concept, used in this study, defines the channel of a stream and adjacent flood plain areas that must be kept free of development in order to safely pass the 100-year flood with a minimal rise in the water surface elevation. The rise must be no more than one foot to meet Federal Insurance Administration standards.

Flood Insurance

The National Flood Insurance Act of 1968 (Title XIII of the Housing and Urban development Act, P.L. 90-448) recognized the necessity for flood plain management. This Act makes federally subsidized insurance available to citizens in communities that adopt regulations controlling future developments of their flood plain. In respect to encroachment on the flood plain, the regulations require:

(1) New residential construction or substantial improvement of existing homes must have the lowest floor level above the elevation of the 100-year flood.

(2) Non-residential construction must meet the same standard or be flood proofed to that level.

The 1968 Act benefits owners of structures already in the flood-prone areas by providing insurance coverage that had been unavailable through private companies. The Act created a cooperative program of insurance against flood damage by the private flood insurance industry and the federal government.

The amount of coverage available and the premium rate varies considerably depending on property location within the flood plain and the property value. All property owners shown in this study to be within areas subject to flooding should consider the purchase of flood insurance.

Additional information on the flood Insurance Program is available from local insurance agents or brokers and the:

Federal Emergency Management Agency, Region VIII
Natural and Technological Hazard Division
Building 710
Denver Federal Center
Denver, Colorado 80225

Telephone 235-4830

The National Flood Insurance Program uses the floodway concept in it's rate studies for communities participating in the regular phase of the programs.

Flood Warning and Flood Forecasting Systems

The National Oceanic and Atmospheric Administration (NOAA) through its' National Weather Service (NWS), maintains year-around surveillance of weather and flood conditions. Daily weather forecasts are issued through the NWS and disseminated by radio and television stations. A general alert to the danger of flash flooding is one of the services provided by the National Weather Service.

Evacuation Plan

An "Emergency Evacuation and Operations Plan" would provide for alerting the public of potential flooding, and coordinating community and county services during an emergency. Plan implementation during the time of an emergency requires cooperation of the general public as well as local officials. This is especially important for flood fighting, evacuation, and rescue operations. Communication is extremely important during flood alerts. Warnings issued through the National Weather Service are disseminated by radio to state and local officials.

Structural Flood Control Measures

This study is somewhat unique for a flood plain management study because of the planning alternatives included. The future without project flooding situation was considered and used in conjunction with 4 alternative treatment plans to analyze project benefits and economic feasibility. Most USDA programs require an alternative treatment plan to be economically feasible in order to qualify for federal funding. Other sources of financing may not require this; therefore, the alternative treatment plans are included herein, whether or not the plan was found economically feasible.

Future Without Project Condition

If no structural flood control improvements were applied within the study area, flooding in the future should continue very similar to what has happened in the past. The extent of flood damages to be expected is shown in the following table:

POTENTIAL FLOOD DAMAGES

TYPE OF DAMAGE 1/	Unit	Number	
Residences Flooded	#	58	
Businesses Flooded	#	9	(in addition, 1 school and the county equipment yard)
Streets Flooded	ft.	4,000	
Culverts-Bridges Damaged	#	22	
I-70 Flooded	ft.	3,000	
Railroad Flooded	ft.	850	
County and Private Roads Flooded	ft.	3,200	

1/ (For 100-year frequency)

The above list of damages have been converted into dollars and used in analyzing benefits for the following alternative treatment plans. (See Structural Measures and Comparison of Alternatives tables).

Alternative No. 1

This alternative considers; (1) collecting runoff from the East Basin drainage above Lower Cactus Valley Ditch and using a drop inlet spillway to pass this floodwater under the ditch to a stable outlet downstream, (2) diverting Sixteenth Street Basin flows to the east boundary of Silt to a collection area and using a drop inlet spillway to pass this water under Grand Avenue, under the Lower Cactus Valley Ditch, and under US Highway 6 to a location where the flows can be outletted to a stable grade, (3) collecting Seventh Street Basin flows at the mouth of the canyon north of town and using a drop inlet spillway and pipe to carry the flows to the Lower Cactus Valley Ditch where it will outlet into the ditch, (4) building up First Street and County Road 231 to divert First Street Basin flows that exceed culvert and channel capacities to an overflow channel. This overflow channel leads to an adjacent drainage to the west. The overflow would be collected at the Lower Cactus Valley Ditch into a drop inlet spillway that would pass under the ditch and continue to an area below the small pond at City Park near Dogwood Drive, (5) lining the Lower Cactus Valley Ditch from Seventh Street to the channel west of town that leads to the City Park referred to in Item 4 above. The lined ditch would handle flood flows from Seventh Street Basin as well as irrigation flows. Ditch flows greater than 50 cfs would be spilled into the City Park drainage because of the limited capacity of an inverted siphon structure a short distance downstream.

This alternative would include no improvements on the West Basin because there appears to be no significant flood damages along this channel.

Alternative No. 2

This alternative would be the same as Alternative No. 1 with the following exceptions:

1. Item number 3 would include a continuation of the pipe under the Lower Cactus Valley Ditch and on south to the railroad. A pipe would be jacked under the railroad to allow discharge at a stable outlet above I-70.

2. Item number 5 (ditch lining) would not be included.

Alternative No. 3

This alternative would include lining the Lower Cactus Valley Ditch from Ninth Street to a spill location at the City Park Drainage. The capacity of the lined ditch would be sufficient to carry flood flows from Seventh Street Basin and normal irrigation flows (50 cfs). Some dike work would also be necessary at County Road 231 on First Street Basin similar to Item No. 4 in Alternative No. 1. There would be no improvements to West Basin, Sixteenth Street Basin, or East Basin in this alternative.

Alternative No. 4

This alternative will involve cleaning and enlargement of the Lower Cactus Valley Ditch from Ninth Street to a spill location at the City Park Drainage. The capacity of the enlarged ditch would be sufficient to carry flood flows from Seventh Street Basin and normal irrigation flows (50 cfs). Some dike work would also be necessary at County Road 231 on First Street Basin similar to item 4 in Alternative No. 1. Regular maintenance would be important with this alternative. There would be no improvements to West Basin, Sixteenth Street Basin, or East Basin.

The following tables show structural measures, estimated construction costs, and benefits for each of the above alternatives.

STRUCTURAL MEASURES

Work Item	Unit	Alt 1	Alt 2	Alt 3	Alt 4
Concrete Drop Inlet Str	Number	4	4	1	1
Concrete Ditch Lining	Feet	3850	---	4870	---
Pipeline	Feet	2400	3430	---	---
Ditch Cleaning & Enlarg.	Feet	1380	1380	1380	6250
Earth Dike	Cu. Yd.	11,700	12,200	---	---

COMPARISON OF ALTERNATIVES 1/

Alternative Cost Comparison	Alt #1	Alt #2	Alt #3	Alt #4
Construction Cost	$ 962,000	$ 783,900	$ 613,800	$ 209,900
Land Rights Cost	227,200	167,200	99,000	99,000
Eng. & Adm. Asst.	298,200	243,000	190,300	65,000
Total Inst. Cost	$1,487,400	$1,194,100	$ 903,100	$ 373,900
Annual Alternative Cost and Effects Comparison	**Alt #1**	**Alt #2**	**Alt #3**	**Alt #4**
Annualized Cost	$ 154,700	$ 124,300	$ 94,100	$ 39,500
Annualized Benefits	13,500	9,400	11,200	7,100
Net Annualized Benefits	$ -141,200	$ -114,900	$ - 82,900	$ - 32,400

1/ Price base September 1986, Discounted and annualized at 8 7/8% for 25 years.

RECOMMENDATIONS

The following recommendations are included for consideration in reducing potential flood damages.

1. Local units of government should implement a flood plain management or flood hazard mitigation plan.
2. Existing restrictions that contribute to overbank flooding should be corrected where possible and when possible.
3. Structural alternatives studied herein do not appear to be economically feasible projects. This is primarily because of the expected shallow depth of flow within the flood plain. Steep slopes through town generally disperse flood waters except in a few locations. The most cost effective alternative studied is Alternative No. 4 discussed under "Structural Flood Control Measures". This set of treatment measures should be considered in more detail.
4. Owners and occupants of buildings and other property within or adjacent to the delineated flood boundary should consider flood insurance.
5. Public information and education programs on flood hazards should be made available to the public.
6. Native habitat along the main channels should be maintained to preserve channel stability and provide wildlife habitat.

GLOSSARY OF TERMS

Channel - A natural or artificial water course of perceptible extent with definite banks to confine and conduct continuously or periodically flowing water. Channel flow is that water which is flowing within the limits of the defined channel.

Flood - Water from a river, stream, water course, lake or other body of standing water, that temporarily overflows the boundaries within which it is ordinarily confined.

Flood Crest - The maximum stage or elevtion reached by the waters of a flood at a given location.

Flood Frequency - A means of expressing the probability of flood occurrences as determined from statistical analysis of representative streamflow or rainfall and runoff records. The frequency of a particular stage or discharge is usually expressed as occurring once in a specified number of years. The 10-, 50-, 100- and 500-year frequency floods have an average frequency of occurrence in the order of once in the number of years as indicated.

10-Year Flood - A flood having an average frequency of occurrence of once in 10 years. It has a 10 percent chance of being equaled or exceeded in any given year.

100-Year Flood - A flood having an average frequency of occurrence of once in 100 years. It has a 1 percent chance of being equaled or exceeded in any given year.

Flood Hazard Areas - Areas susceptible to flood damage.

Flood Peak - The highest stage or discharge attained during a flood event; also referred to as peak stage or peak discharge.

Flood Plain - The relatively flat or lowland area adjoining a river, stream, watercourse, lake, or other body of standing water which has been or may be covered temporarily by flood water. For administrative purposes the flood plain may be defined as the area that would be inundated by the 100-year flood.

Left Stream Bank - The left bank of the stream when looking downstream.

Perched Channel Flow - A condition where the flow elevation in the outer portions of the flood plain is higher than the flow elevation in the main channel. This condition occurs when a higher secondary channel receives inflow from some location upstream and maintains a flatter slope than the main channel.

Reach - A hydraulic engineering term used to describe longitudinal segments of a stream or river.

Right Stream Bank - The right bank of the stream when looking downstream.

Runoff - That part of precipitation, as well as any other flow contributions, which appears in surface streams of either perennial or intermittent form.

Stream - Any natural channel or depression through which water flows whether continuously, intermittently, or periodically, including modification of the natural channel or depression.

Structure - Anything constructed or erected, the use of which requires a more or less permanent location on or in the ground. Includes but is not limited to bridges, buildings, canals, dams, ditches, diversions, irrigation systems, pumps, pipelines, railroads, roads sewage disposal systems, underground conduits, water supply systems and wells.

Typical Valley Cross Section - An engineering drawing of a vertical section of a stream channel and adjoining landscape as viewed in a

downstream direction. The drawing represents a specified location within a designated stream reach.

Water Surface Profile - (This term is synonymous with Flood Profile) - a graph showing the relationship of the water surface elevation of a flood event to location along a stream or river.

Watersheds - A drainage basin or area which collects runoff and transmits it usually by means of streams and tributaries to the outlet of the basin.

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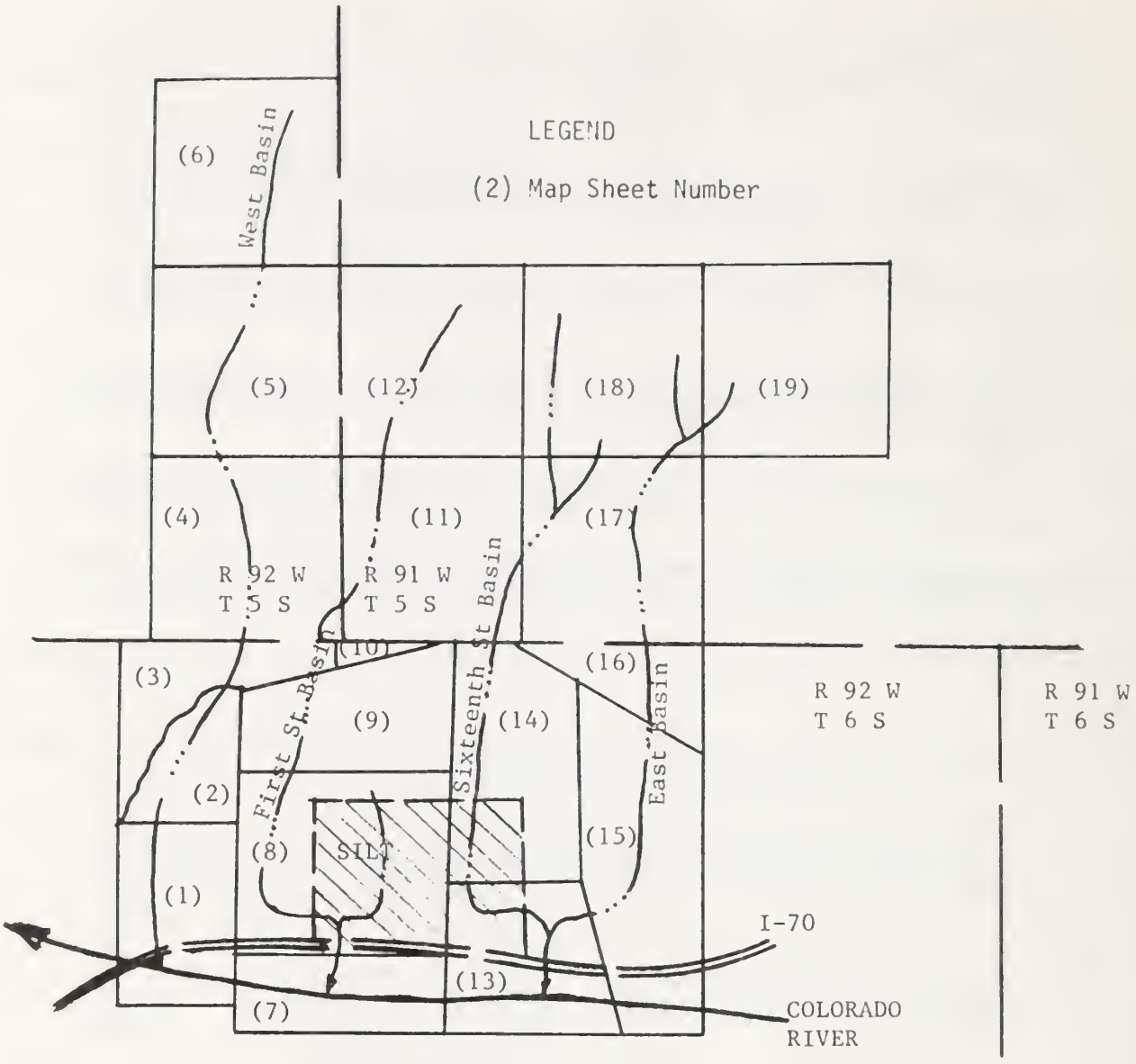

FLOOD PLAIN INDEX MAP

TOWN OF SILT

FLOOD PLAIN MANAGEMENT STUDY

LEGEND
FLOOD PLAIN LIMITS

100 YEAR FLOOD

GROUND ELEVATION IN FEET MEAN SEA LEVEL DATUM — 5280

CONTOUR INTERVAL 2.0'

CROSS SECTION A — A

CROSS SECTION CONTINUED

INTERMITTENT STREAM

HORIZONTAL CONTROL △272 — Center Line Station in 100ft from lower study limit

VERTICAL CONTROL ○

PHOTO CENTER ⊙

GRID POINT +

100 YEAR FLOOD ELEV. — 5280

C-69 INDEX NUMBER FOR COLORADO RIVER MAPPING PROJECT

SHEETS 1,6 AND PARTS OF 2,7,10,11

TOPOGRAPHY COMPILED BY PHOTOGRAMMETRIC METHODS FROM 6" C.F.L. VERTICAL AERIAL PHOTOGRAPHY TAKEN NOV. 15,16 & 17, 1982. BASIS OF HORIZONTAL CONTROL: THE COLORADO STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, LAMBERT CONFORMAL CONIC PROJECTION. THE FOLLOWING (USC & GS AND /OR USGS) TRIANGULATION STATIONS WERE USED: CATHERINE COORDINATES X=1,516,508.42 Y=581,255.78. GNAT–X=1,231,566.60 Y=523,643.10. BASIS OF VERTICAL CONTROL: USC & GS SEA LEVEL DATUM BASED ON THE FOLLOWING BENCHMARKS: O-156 ELEVATION 6192.284, 4870.74PS-ELEVATION 4869.860. PREPARED BY ANALYTICAL SURVEYS, INC. 4167 SINTON ROAD, COLORADO SPRINGS, CO. 80907.

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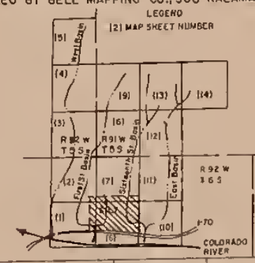

REVISION	DATE	BY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PLAINS
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

SCALE 200 0 200 400 600 IN FEET

SHEET 1 OF 14

LEGEND
FLOOD PLAIN LIMITS

100 YEAR FLOOD

GROUND ELEVATION IN FEET MEAN SEA LEVEL DATUM — 5280

CONTOUR INTERVAL 2.0'

CROSS SECTION A — A

CROSS SECTION CONTINUED

INTERMITTENT STREAM — Center Line Station in 1000's from lower study limit

HORIZONTAL CONTROL △272

VERTICAL CONTROL ○

PHOTO CENTER ◇

GRID POINT +

100 YEAR FLOOD ELEV. 5280

N

MATCH SHEET 3

MATCH SHEET 1

MATCH SHEET 4

WEST BASIN

SOUTHWEST BASIN

WEST BASIN

C.R. 229

C.R. 231

Ruin

C-69 INDEX NUMBER FOR COLORADO RIVER MAPPING PROJECT

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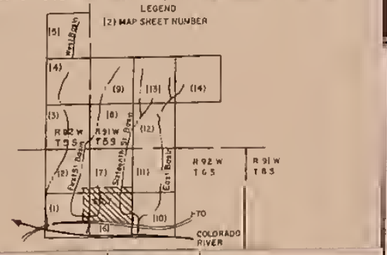

REVISION	DATE	BY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PLAINS
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

SCALE 200 0 200 400 600 FEET

SHEET 2 OF 14

LEGEND
FLOOD PLAIN LIMITS

100 YEAR FLOOD

GROUND ELEVATION IN FEET MEAN SEA LEVEL DATUM — 5280

CONTOUR INTERVAL 2.0'

CROSS SECTION — A — A

CROSS SECTION CONTINUED

INTERMITTENT STREAM

HORIZONTAL CONTROL — △272 — Center Line Station in 100's from lower study limit

VERTICAL CONTROL — ○

PHOTO CENTER — ⬡

GRID POINT — +

100 YEAR FLOOD ELEV. — 5280

C-69 INDEX NUMBER FOR COLORADO RIVER MAPPING PROJECT

SHEETS 1,6 AND PARTS OF 2,7,10,11

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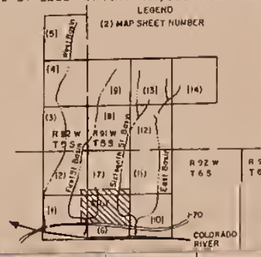

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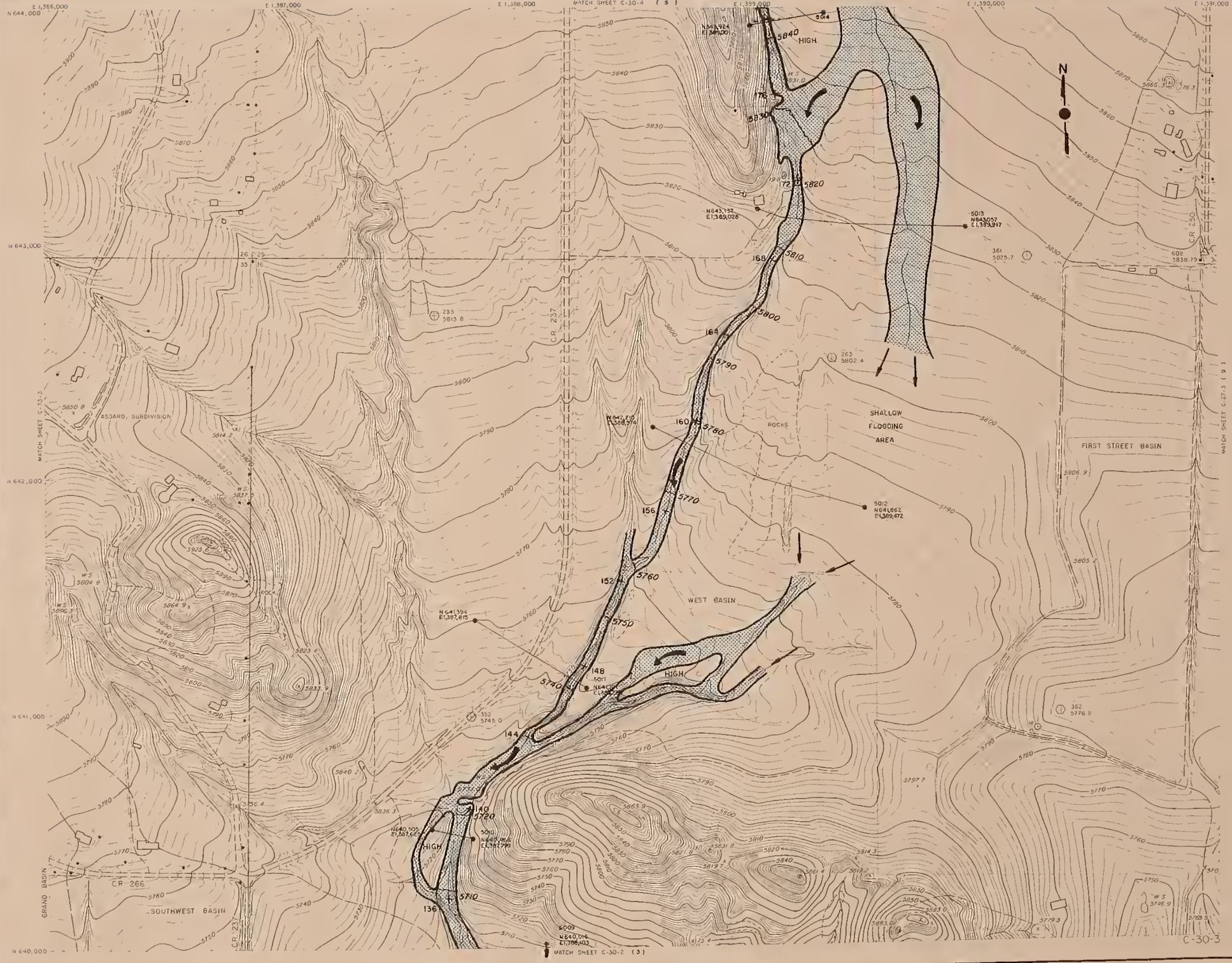
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PLAINS
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

SCALE 200 0 200 400 600 IN FEET

SHEET 3 OF 14



LEGEND
FLOOD PLAIN LIMITS

100 YEAR FLOOD

GROUND ELEVATION IN FEET MEAN SEA LEVEL DATUM — 5280

CONTOUR INTERVAL 2.0'

CROSS SECTION A — A

CROSS SECTION CONTINUED

INTERMITTENT STREAM — Center Line Station in 1000's from lower study limit

HORIZONTAL CONTROL △272

VERTICAL CONTROL ○

PHOTO CENTER ⬡

GRID POINT +

100 YEAR FLOOD ELEV. — 5280

C-69 INDEX NUMBER FOR COLORADO RIVER MAPPING PROJECT

SHEETS 1,6 AND PARTS OF 2,7,10,11

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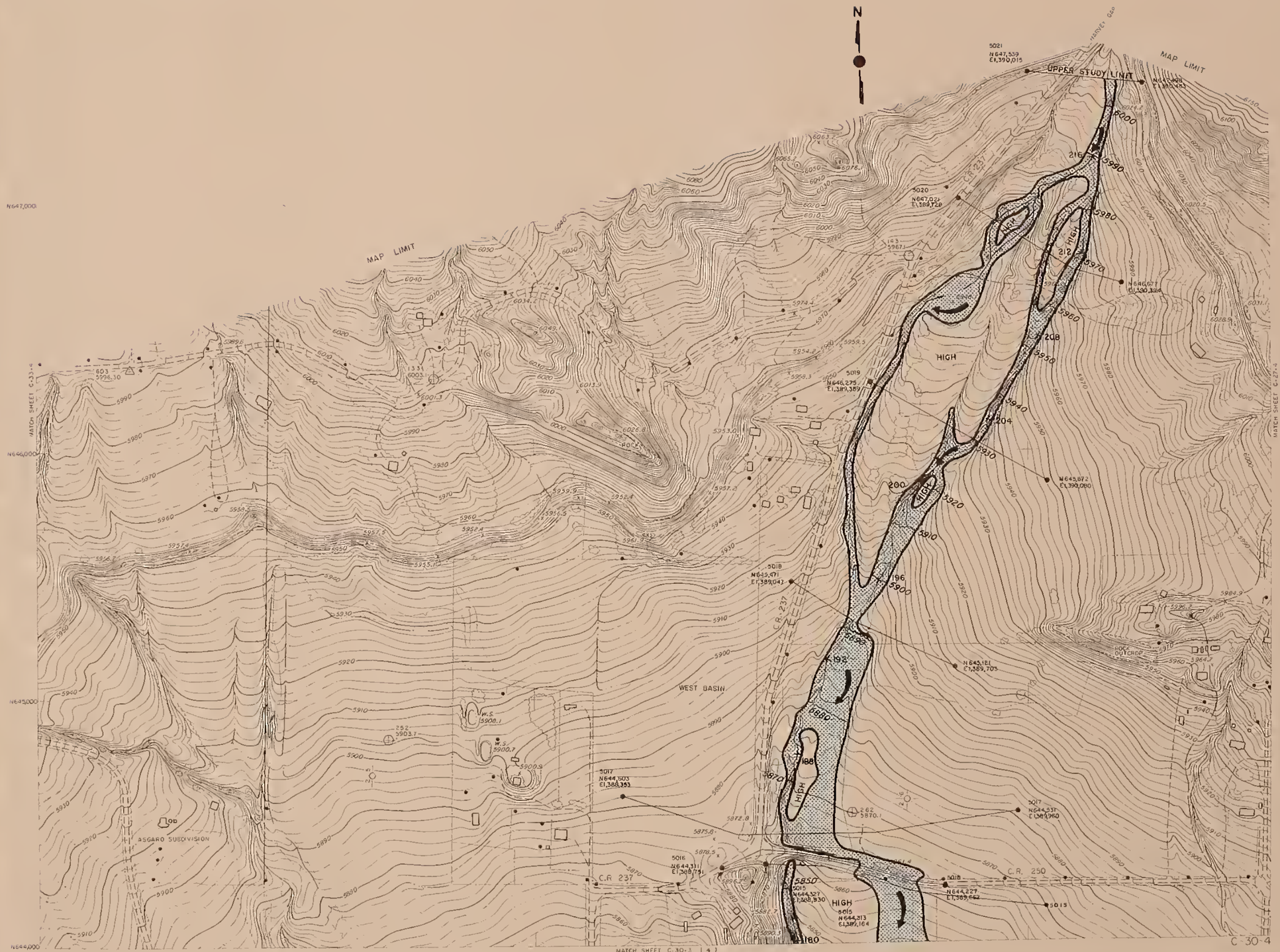
SOIL CONSERVATION SERVICE

FLOOD PLAINS
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

SCALE 200 0 200 400 600 IN FEET

SHEET 4 OF 14



LEGEND
FLOOD PLAIN LIMITS

100 YEAR FLOOD

GROUND ELEVATION IN FEET MEAN SEA LEVEL DATUM — 5280

CONTOUR INTERVAL 2.0'

CROSS SECTION A — A

CROSS SECTION CONTINUED

INTERMITTENT STREAM

HORIZONTAL CONTROL △272 — Center Line Station in 100ft. from lower study limit

VERTICAL CONTROL ○

PHOTO CENTER ⬡

GRID POINT +

100 YEAR FLOOD ELEV. 5280

C-69 INDEX NUMBER FOR COLORADO RIVER MAPPING PROJECT

SHEETS 1, 6 AND PARTS OF 2,7,10,11

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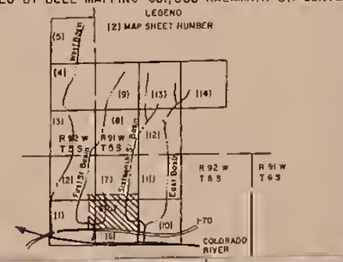

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FLOOD PLAINS
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

200 0 200 400 600
SCALE IN FEET

SHEET 5 OF 14

LEGEND
FLOOD PLAIN LIMITS

100 YEAR FLOOD

GROUND ELEVATION IN FEET MEAN SEA LEVEL DATUM 5280

CONTOUR INTERVAL 2.0'

CROSS SECTION A A

CROSS SECTION CONTINUED

INTERMITTENT STREAM

HORIZONTAL CONTROL △272 Center Line Station in 100 ft. from lower study limit

VERTICAL CONTROL ○

PHOTO CENTER ⬡

GRID POINT +

100 YEAR FLOOD ELEV. 5280

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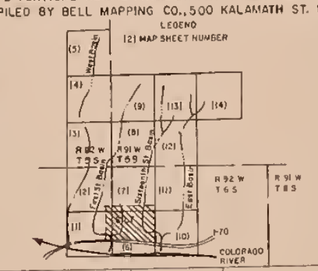

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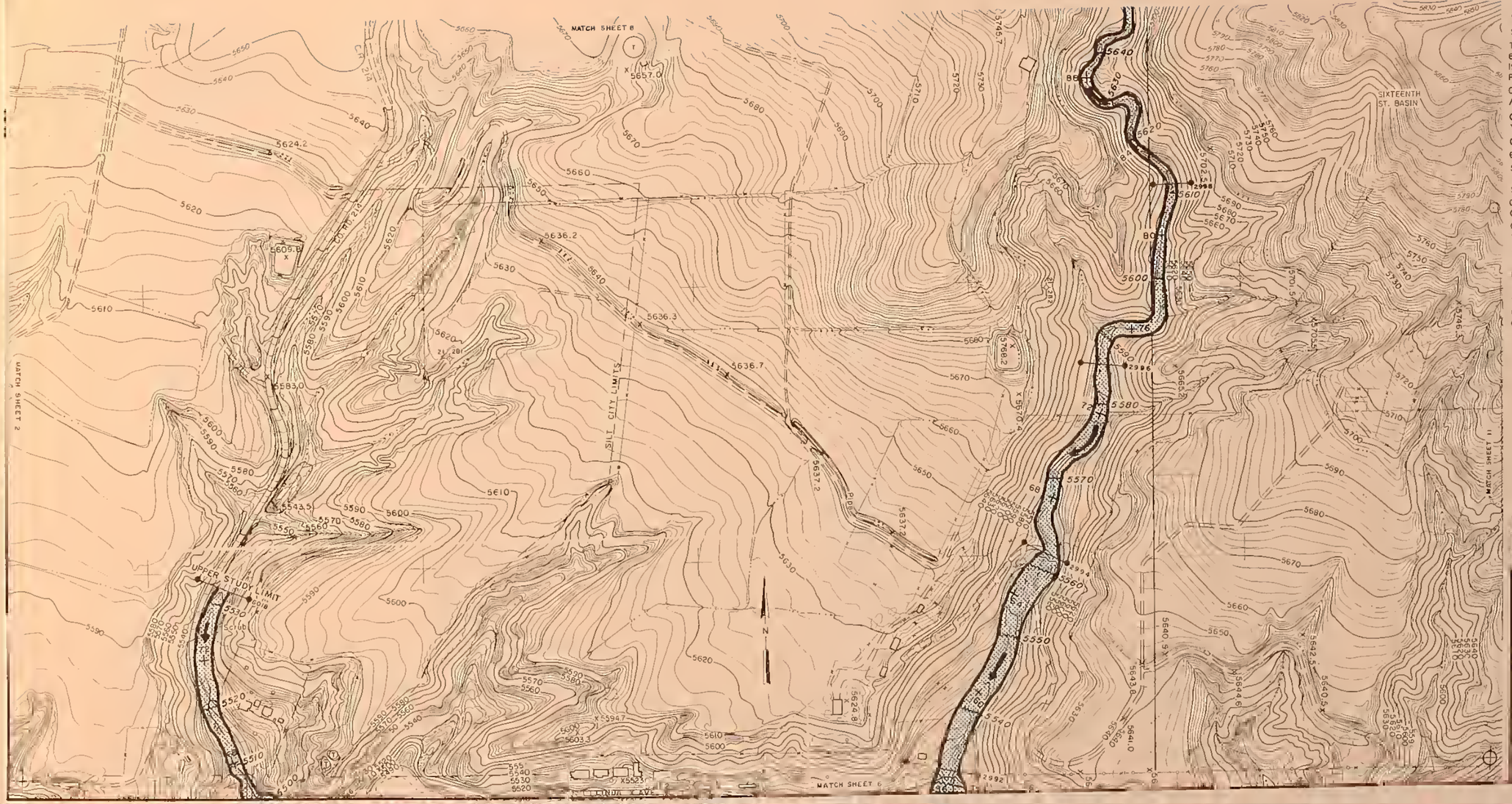
SOIL CONSERVATION SERVICE

FLOOD PLAINS
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

SCALE 200 0 200 400 600 IN FEET

SHEET 6 OF 14



LEGEND
FLOOD PLAIN LIMITS

100 YEAR FLOOD

GROUND ELEVATION IN FEET MEAN SEA LEVEL DATUM — 5280

CONTOUR INTERVAL 2.0'

CROSS SECTION — A — A

CROSS SECTION CONTINUED

INTERMITTENT STREAM

HORIZONTAL CONTROL — △272

VERTICAL CONTROL — ○

PHOTO CENTER — ⬡

GRID POINT — +

100 YEAR FLOOD ELEV. — 5280

Center Line Station in 100 ft. from lower study limit

C-69 INDEX NUMBER FOR COLORADO RIVER MAPPING PROJECT

SHEETS 1,6 AND PARTS OF 2,7,10,11

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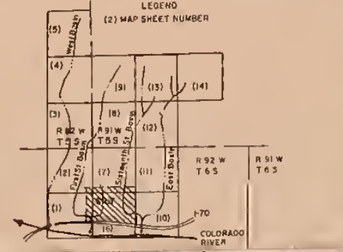

REVISION	DATE	BY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PLAINS
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

200 0 200 400 600
SCALE

SHEET 7 OF 14

MATCH SHEET C-27-3 (9)

MATCH SHEET C-30-2 (13)

MATCH SHEET C-23-2 (12)

E 1,391,000 E 1,392,000 E 1,393,000 E 1,394,000 E 1,395,000 E 1,396,000

N 640,000 N 639,000 N 638,000 N 637,000 N 636,000

LEGEND
FLOOD PLAIN LIMITS

100 YEAR FLOOD

GROUND ELEVATION IN FEET MEAN SEA LEVEL DATUM — 5280

CONTOUR INTERVAL 2.0'

CROSS SECTION A — A

CROSS SECTION CONTINUED

INTERMITTENT STREAM

HORIZONTAL CONTROL △272

VERTICAL CONTROL ○

PHOTO CENTER ⬡

GRID POINT +

100 YEAR FLOOD ELEV. 5280

Center Line Station in 100ft. from lower study limit

C-69 INDEX NUMBER FOR COLORADO RIVER MAPPING PROJECT

SHEETS 1,6 AND PARTS OF 2,7,10,11

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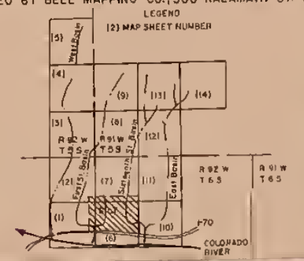

REVISION	DATE	BY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PLAINS
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

200 0 200 400 600
SCALE IN FEET

SHEET 8 OF 14

LEGEND
FLOOD PLAIN LIMITS

100 YEAR FLOOD

GROUND ELEVATION IN FEET MEAN SEA LEVEL DATUM — 5280

CONTOUR INTERVAL 2.0'

CROSS SECTION — A — A

CROSS SECTION CONTINUED

INTERMITTENT STREAM

HORIZONTAL CONTROL △272 — Center Line Station in 100ft. from lower study limit

VERTICAL CONTROL

PHOTO CENTER

GRID POINT

100 YEAR FLOOD ELEV. — 5280

C-69 INDEX NUMBER FOR COLORADO RIVER MAPPING PROJECT

SHEETS 1,6 AND PARTS OF 2,7,10,11
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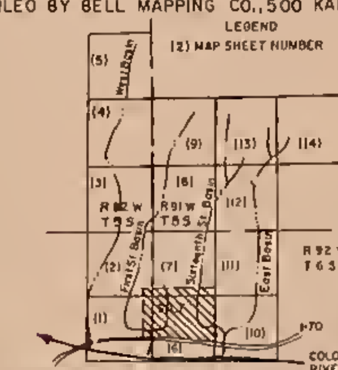

REVISION	DATE	BY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PLAINS
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

SCALE IN FEET: 200 0 200 400 600

SHEET 9 OF 14

LEGEND
FLOOD PLAIN LIMITS

100 YEAR FLOOD

GROUND ELEVATION IN FEET MEAN SEA LEVEL DATUM — 5280

CONTOUR INTERVAL 2.0'

CROSS SECTION — A — A

CROSS SECTION CONTINUED

INTERMITTENT STREAM

HORIZONTAL CONTROL △272

VERTICAL CONTROL ○

PHOTO CENTER ⊙

GRID POINT +

100 YEAR FLOOD ELEV. 5280

Center Line Station in 1001's from lower study limit

C-69 INDEX NUMBER FOR COLORADO RIVER MAPPING PROJECT

SHEETS 1,6 AND PARTS OF 2,7,10,11

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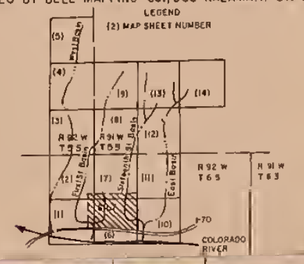


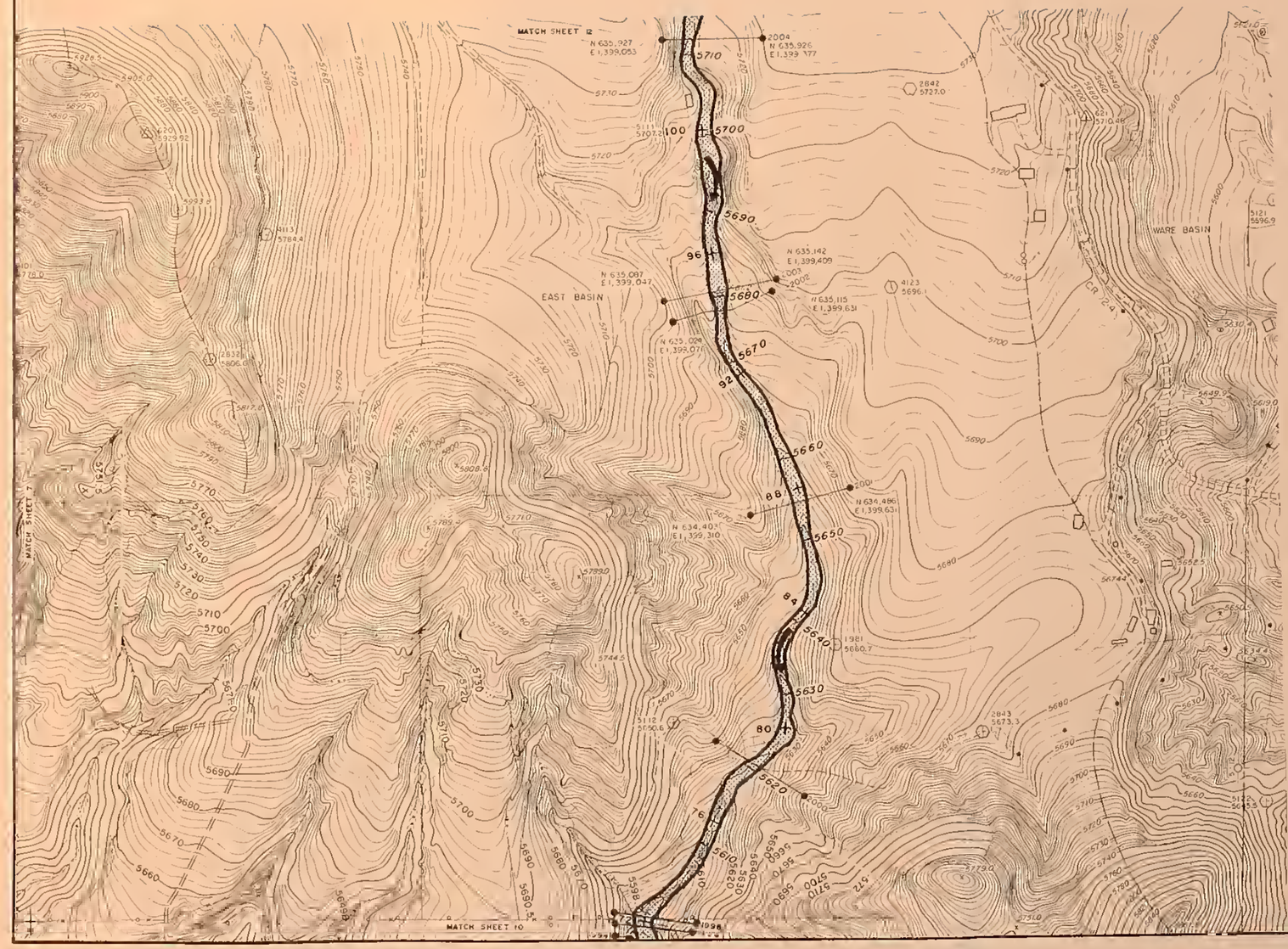
REVISION	DATE	BY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PLAINS
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

200 0 200 400 600
SCALE IN FEET

SHEET 10 OF 14



N

LEGEND
FLOOD PLAIN LIMITS

100 YEAR FLOOD

GROUND ELEVATION IN FEET MEAN SEA LEVEL DATUM — 5280

CONTOUR INTERVAL 2.0'

CROSS SECTION — A — A

CROSS SECTION CONTINUED

INTERMITTENT STREAM

HORIZONTAL CONTROL — △272

VERTICAL CONTROL

PHOTO CENTER

GRID POINT

100 YEAR FLOOD ELEV. — 5280

Center Line Station in 100ft. from lower study limit

C-69 INDEX NUMBER FOR COLORADO RIVER MAPPING PROJECT

SHEETS 1,6 AND PARTS OF 2,7,10,11

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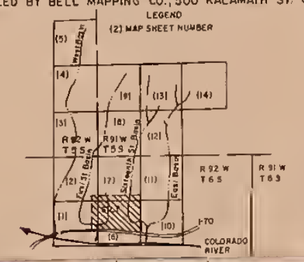

REVISION	DATE	BY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PLAINS
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

200 0 200 400 600
SCALE IN FEET

SHEET 11 OF 14

LEGEND
FLOOD PLAIN LIMITS

100 YEAR FLOOD

GROUND ELEVATION IN FEET MEAN SEA LEVEL DATUM — 5280

CONTOUR INTERVAL 2.0'

CROSS SECTION A — A

CROSS SECTION CONTINUED

INTERMITTENT STREAM

HORIZONTAL CONTROL △272

VERTICAL CONTROL ○

PHOTO CENTER ⬡

GRID POINT +

100 YEAR FLOOD ELEV. 5280

Center Line Station in 100 ft. from lower study limit

C-69 INDEX NUMBER FOR COLORADO RIVER MAPPING PROJECT

SHEETS 1,6 AND PARTS OF 2,7,10,11

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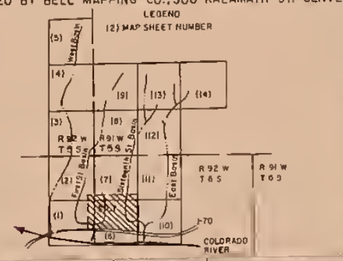

REVISION	DATE	BY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PLAINS
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

200 0 200 400 600
SCALE IN FEET

SHEET 12 OF 14

LEGEND
FLOOD PLAIN LIMITS

100 YEAR FLOOD

GROUND ELEVATION IN FEET MEAN SEA LEVEL DATUM — 5280

CONTOUR INTERVAL 2.0'

CROSS SECTION — A — A

CROSS SECTION CONTINUED

INTERMITTENT STREAM

HORIZONTAL CONTROL — △272 — Center Line Station in 100ft. from lower study limit

VERTICAL CONTROL — ○

PHOTO CENTER — ⬡

GRID POINT — +

100 YEAR FLOOD ELEV. — 5280

C-69 INOEX NUMBER FOR COLORAOO RIVER MAPPING PROJECT

SHEETS 1,6 AND PARTS OF 2,7,10,11

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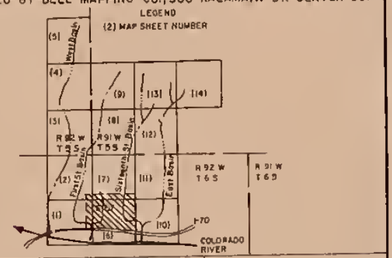


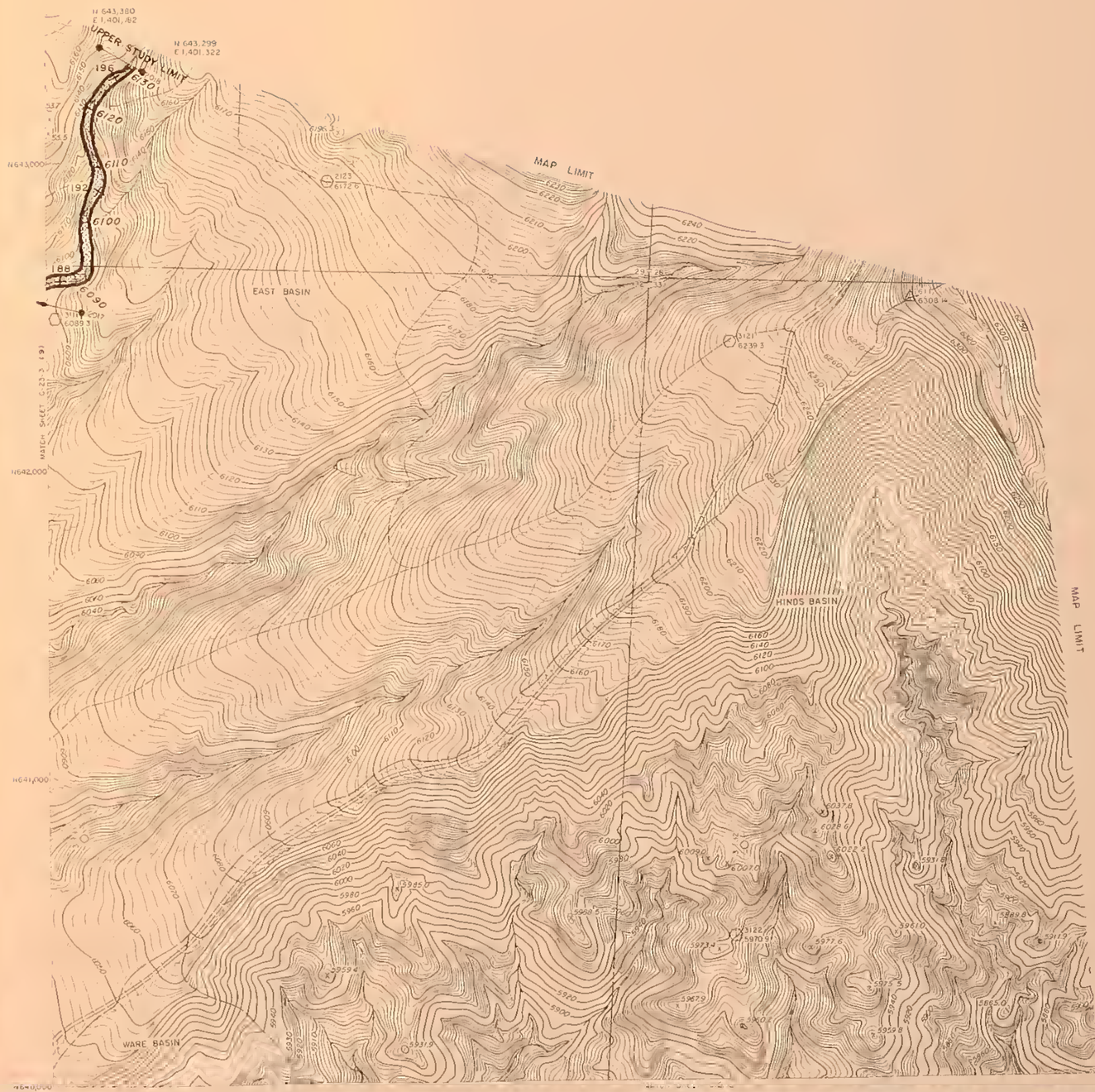
REVISION	DATE	BY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PLAINS
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

200 0 200 400 600
SCALE IN FEET

SHEET 13 OF 14



N

LEGEND
FLOOD PLAIN LIMITS

100 YEAR FLOOD

GROUND ELEVATION IN FEET MEAN SEA LEVEL DATUM — 5280

CONTOUR INTERVAL 2.0'

CROSS SECTION — A — A

CROSS SECTION CONTINUED

INTERMITTENT STREAM — Center Line

HORIZONTAL CONTROL — △272 — Station in 100 ft. from lower study limit

VERTICAL CONTROL — ○

PHOTO CENTER — ◇

GRID POINT — +

100 YEAR FLOOD ELEV. — 5280

C-69 INDEX NUMBER FOR COLORADO RIVER MAPPING PROJECT

SHEETS 1, 6 AND PARTS OF 2, 7, 10, 11

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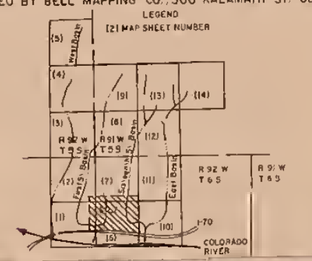


REVISION	DATE	BY

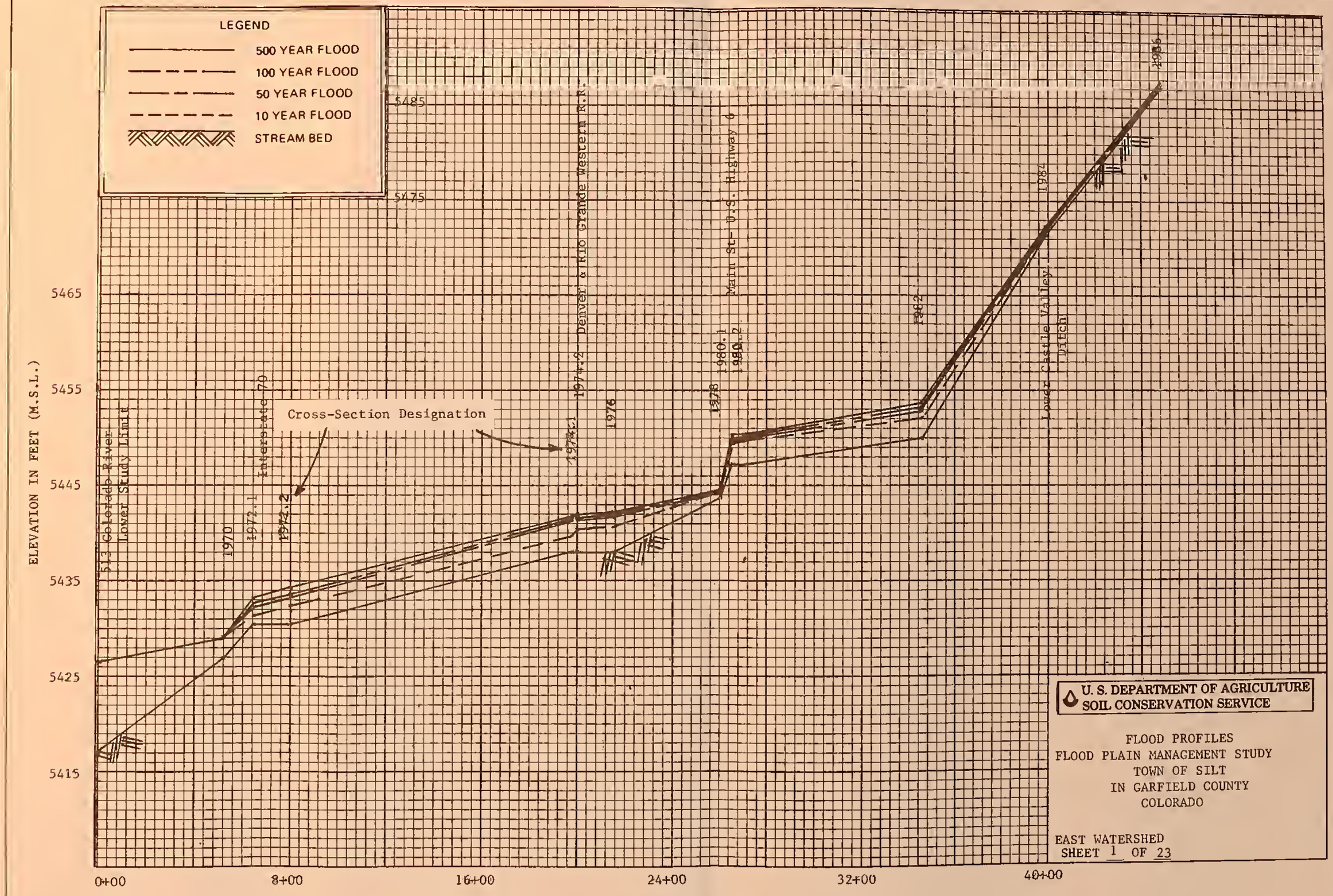
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PLAINS
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

200 0 200 400 600
SCALE IN FEET

SHEET 14 OF 14

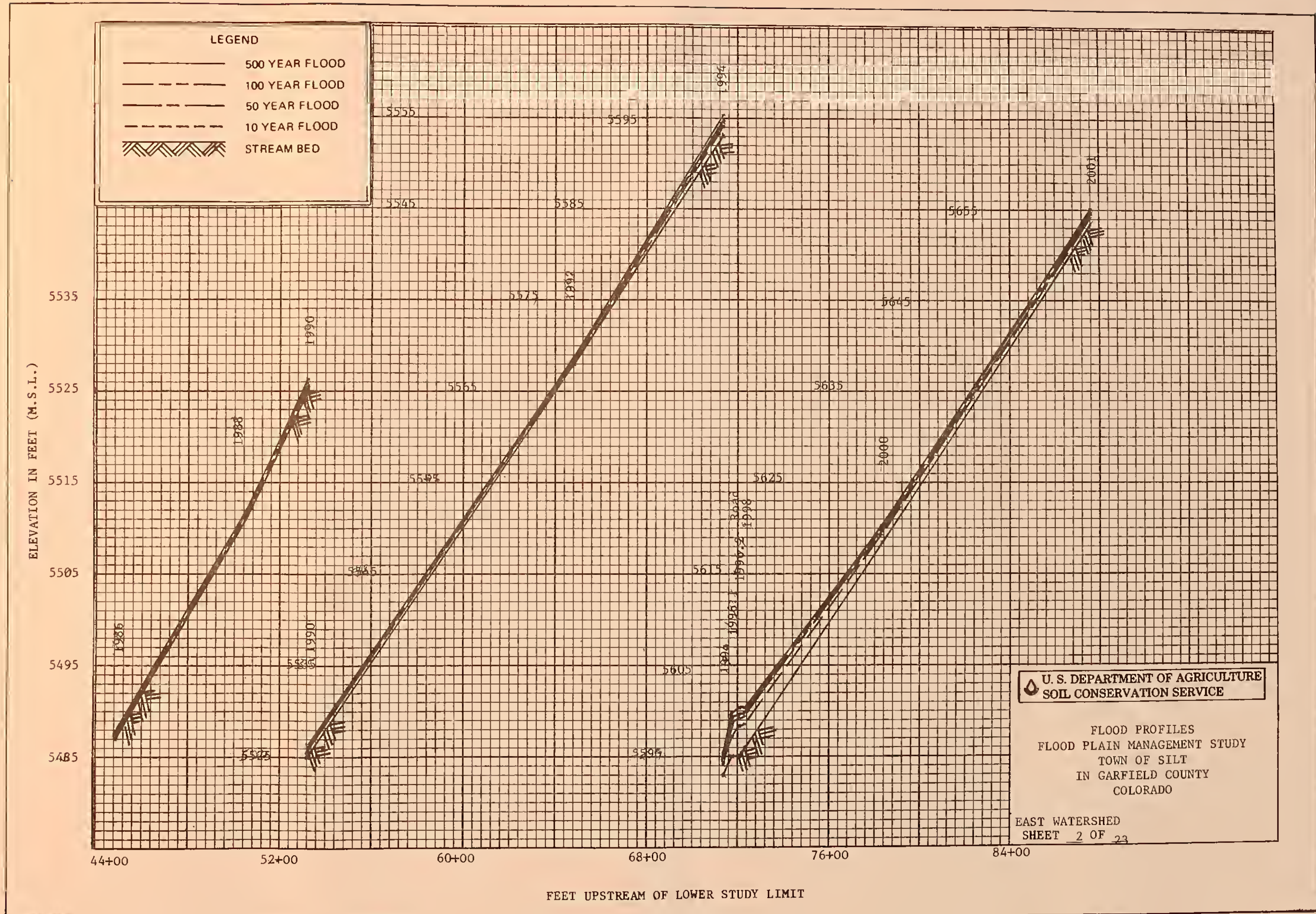
C-21-3



U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

EAST WATERSHED
SHEET 1 OF 23


LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5535
5525
5515
5505
5495
5485
5555
5545
5595
5585
5575
5565
5655
5645
5635
5625
5615
5605
1986
1988
1990
1992
1994
2000
2001
44+00
52+00
60+00
68+00
76+00
84+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO
EAST WATERSHED
SHEET 2 OF 23

LEGEND

500 YEAR FLOOD

100 YEAR FLOOD

50 YEAR FLOOD

10 YEAR FLOOD

STREAM BED

ELEVATION IN FEET (M.S.L.)

5700
5690
5680
5670
5660
5650

2001 2002 2003 2004 2005 2006 2007 2008 2009

5710 5730 5750 5770 5780 5800 5810 5820

Co. Rd. 214

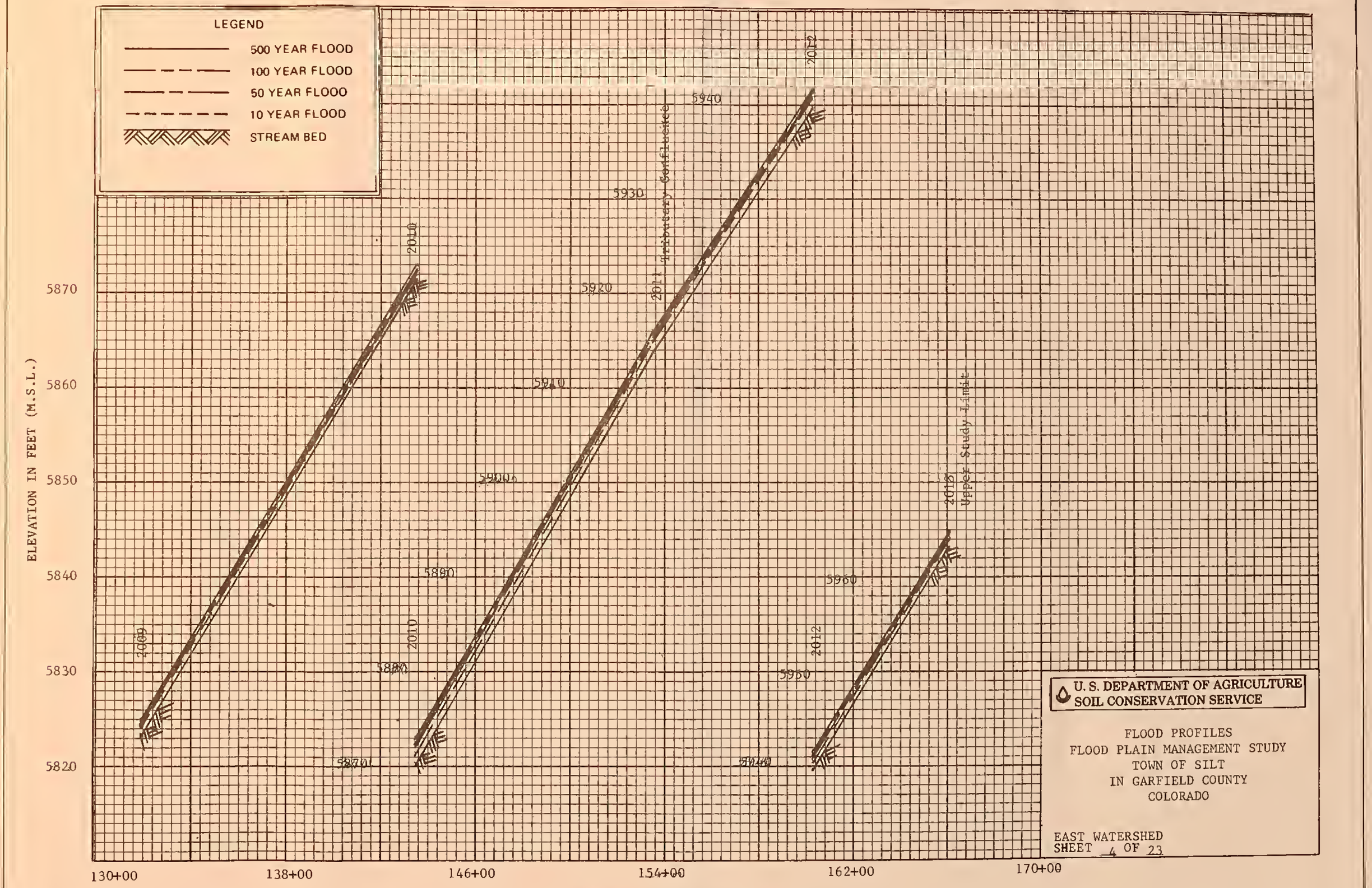
86+00 94+00 102+00 110+00 118+00 126+00

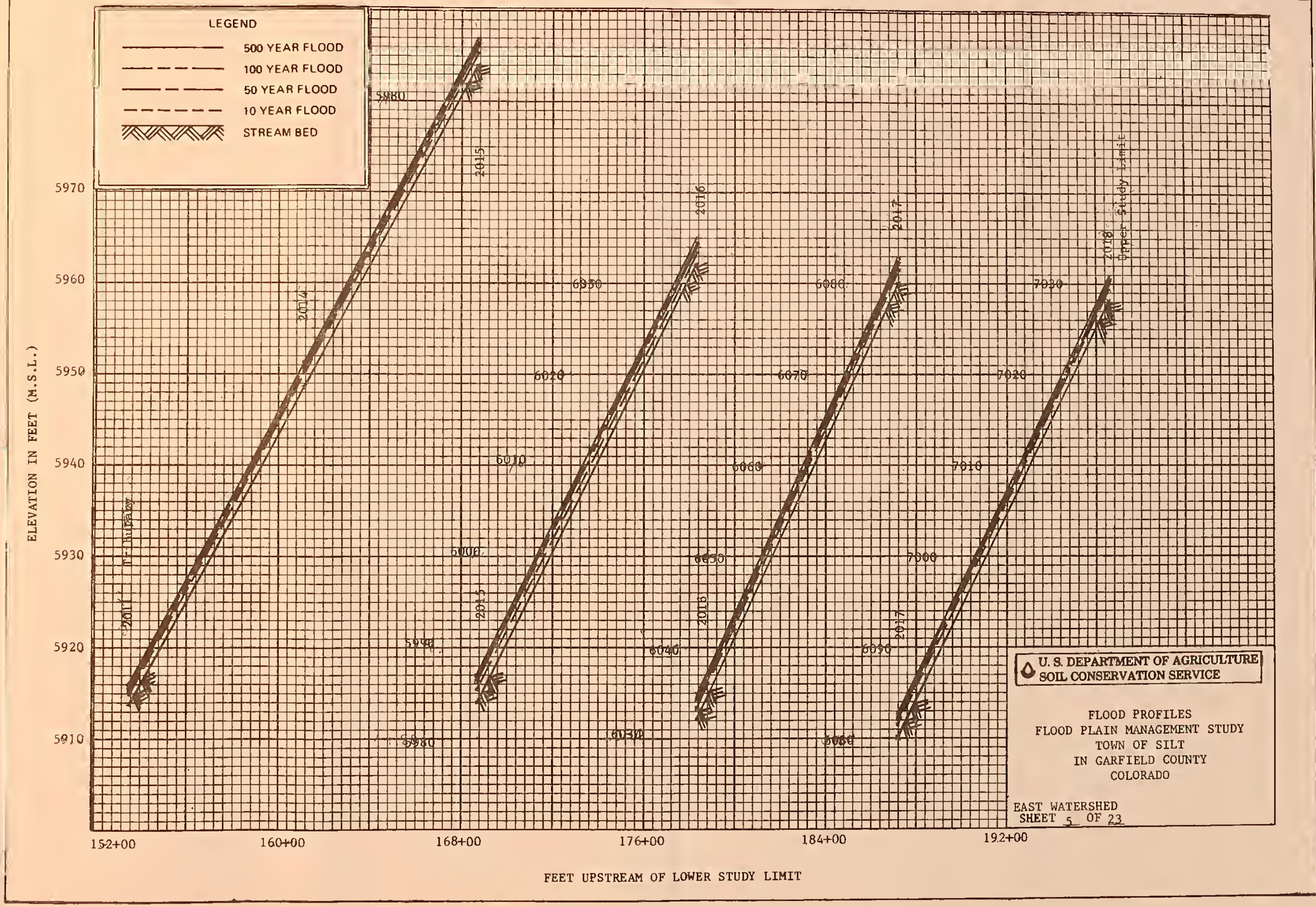
FEET UPSTREAM OF LOWER STUDY LIMIT

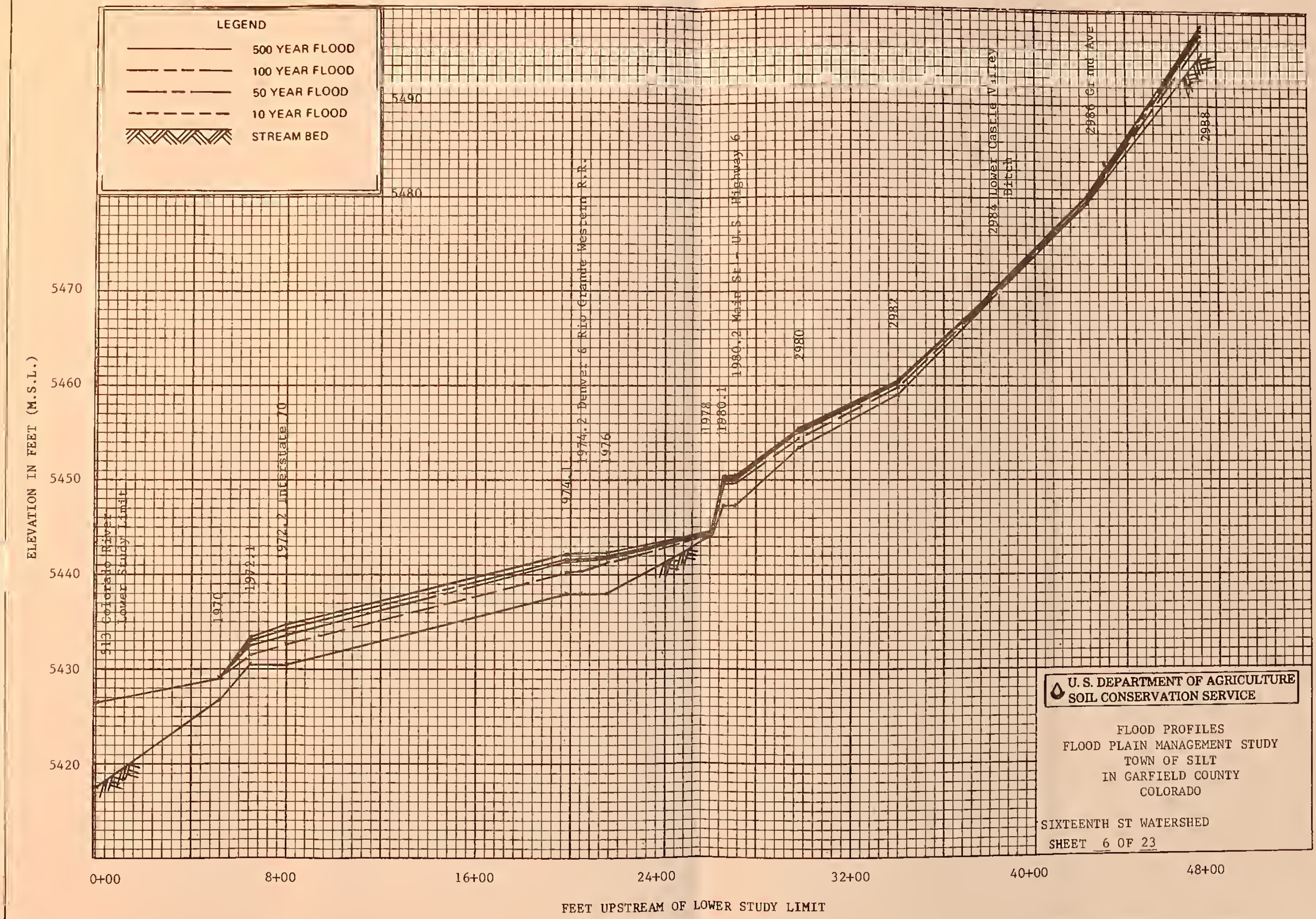
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

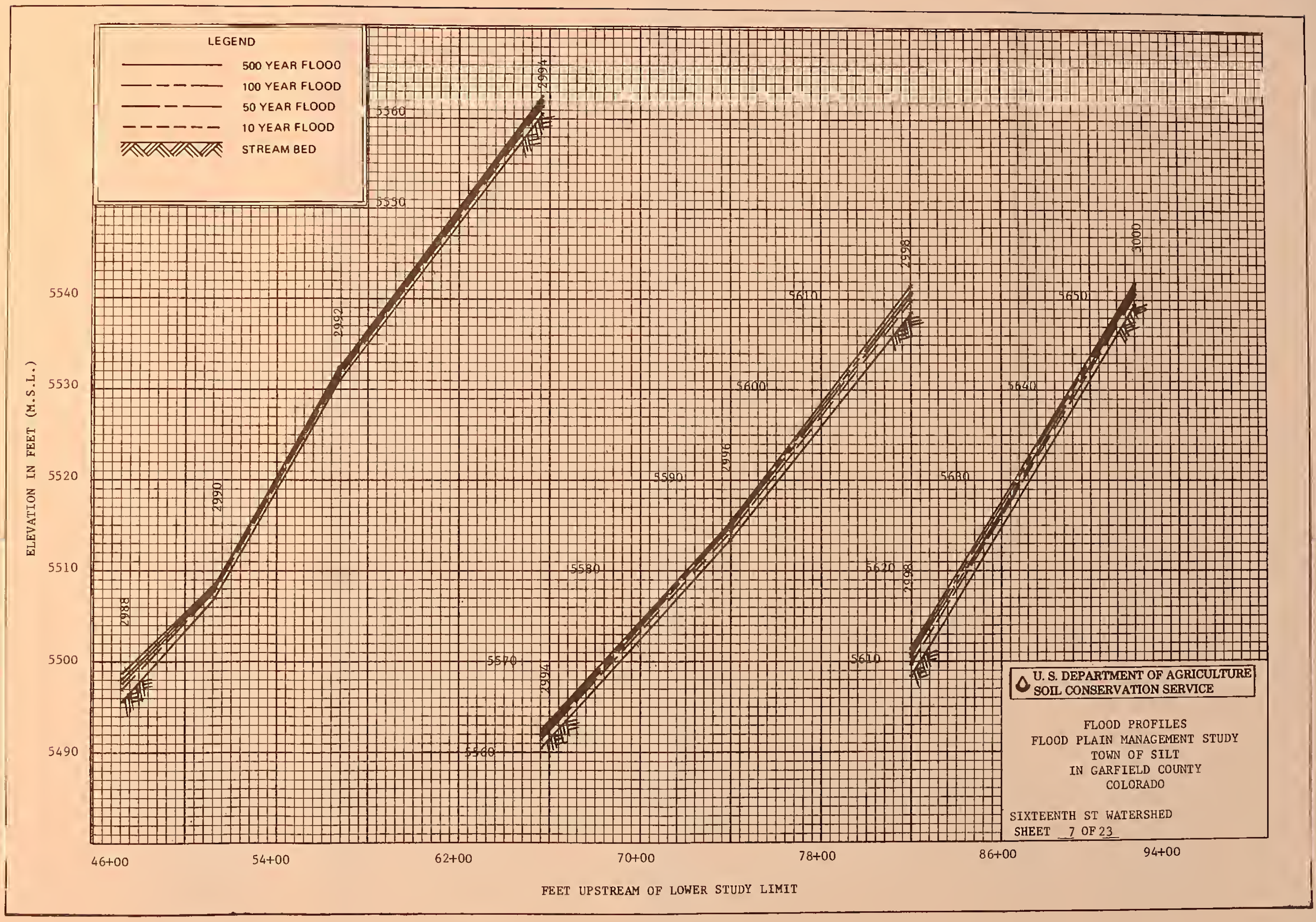
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

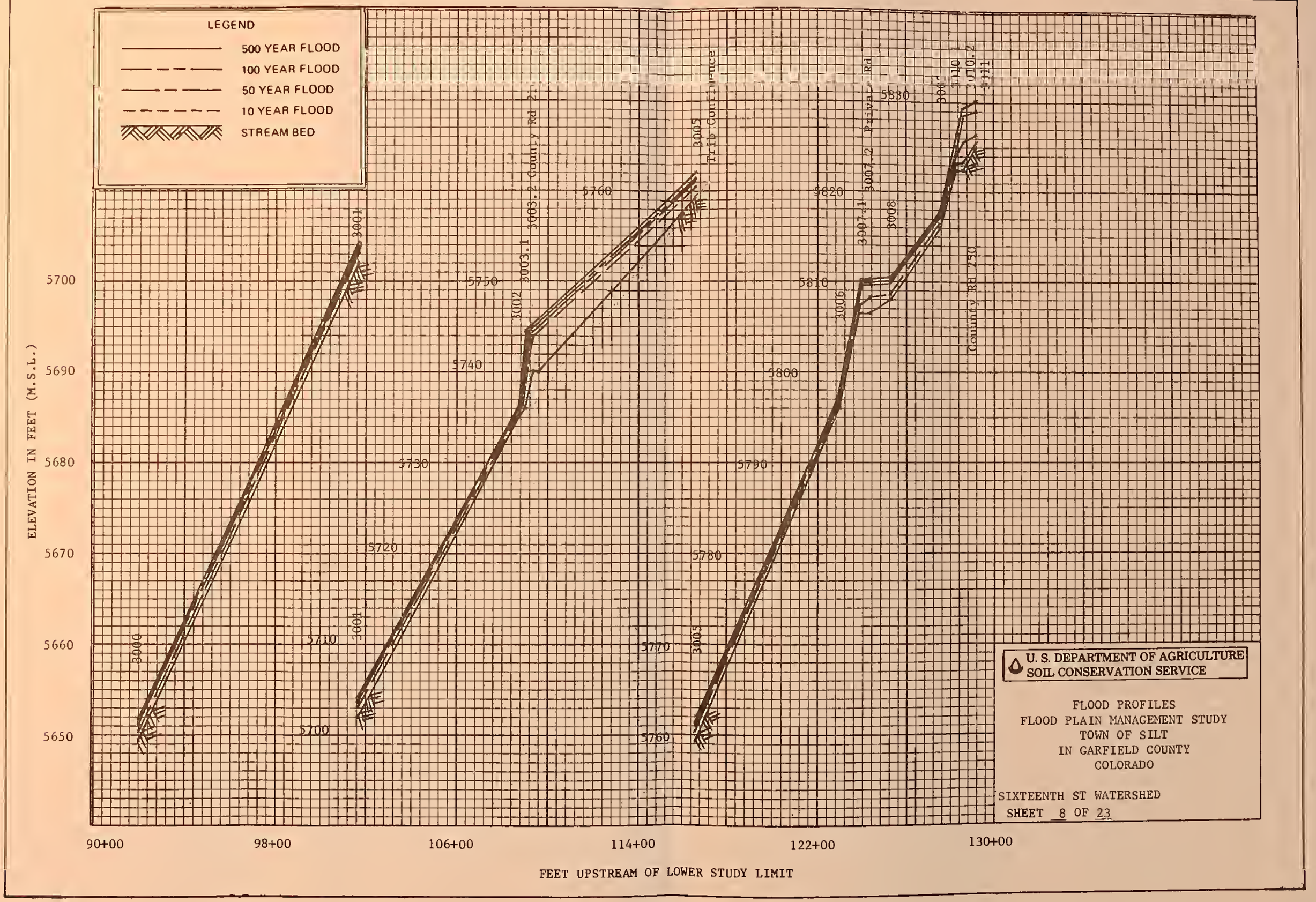
EAST WATERSHED
SHEET 3 OF 23

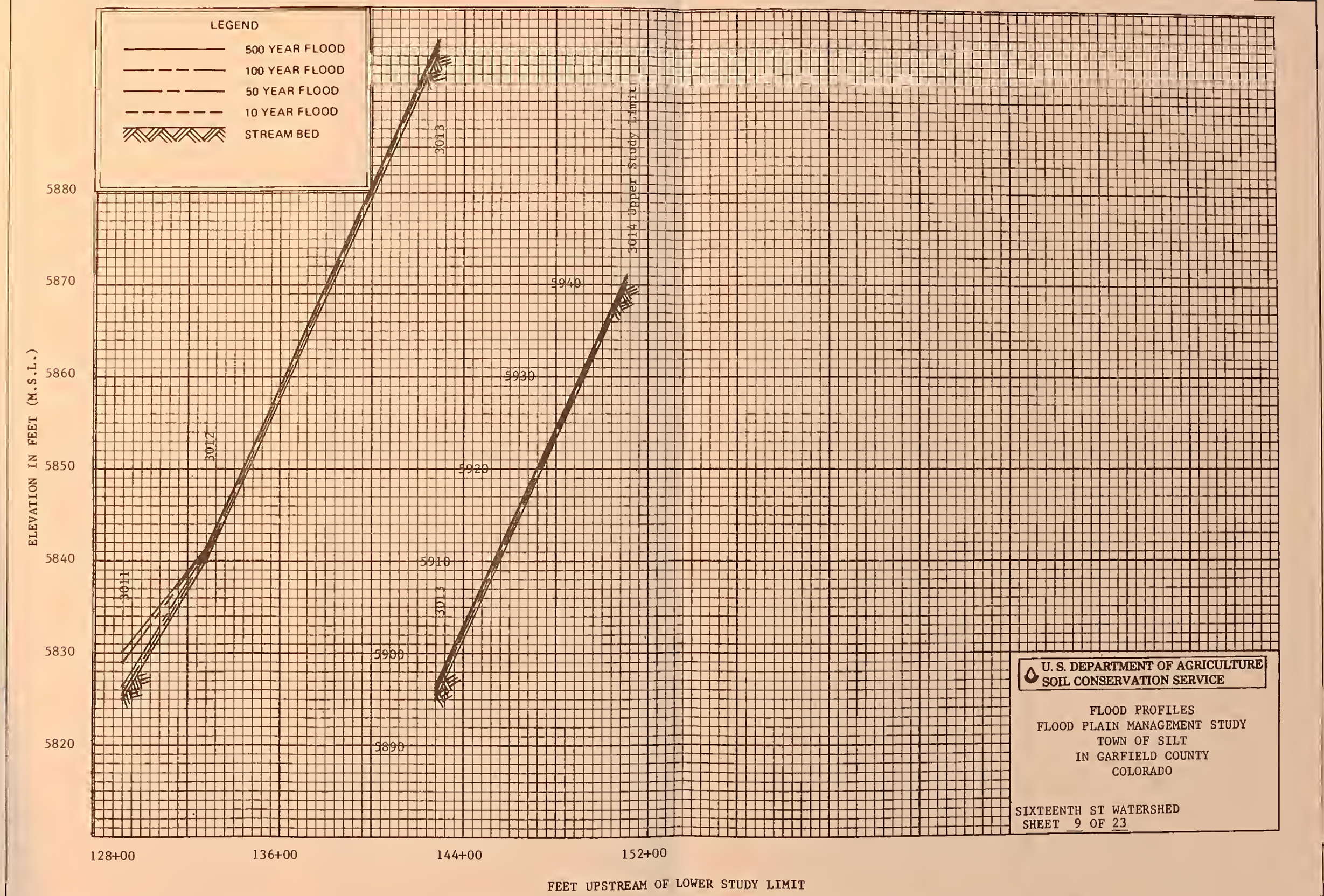

LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5870
5860
5850
5840
5830
5820
2000
2010
2012
2015
5940
5930
5920
5910
5890
5880
5960
5950
Tributary Confluence
Upper Study Limit
130+00
138+00
146+00
154+00
162+00
170+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO
EAST WATERSHED
SHEET 4 OF 23


LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5970
5960
5950
5940
5930
5920
5910
2014
2015
2016
2017
2018
Upper Study Limit
5980
6030
6010
6080
6070
7030
7020
6060
7010
6000
6050
7000
6040
6090
6080
6030
152+00
160+00
168+00
176+00
184+00
192+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO
EAST WATERSHED
SHEET 5 OF 23


LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5490
5480
5470
5460
5450
5440
5430
5420
1974.2 Denver & Rio Grande Western R.R.
1978
1980.1
1980.2 Main St. - U.S. Highway 6
2980
2982
2984 Lower Castle Valley Ditch
2986 Grand Ave
2988
513 Colorado River Lower Study Limit
1970
1972.1
1972.2 Interstate 70
1974
1976
0+00
8+00
16+00
24+00
32+00
40+00
48+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO
SIXTEENTH ST WATERSHED
SHEET 6 OF 23


LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5540
5530
5520
5510
5500
5490
5560
5550
5610
5600
5590
5580
5570
5560
5650
5640
5680
5620
5610
2994
2992
2990
2988
2998
2996
2994
3000
2998
2996
2994
2988
46+00
54+00
62+00
70+00
78+00
86+00
94+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO
SIXTEENTH ST WATERSHED
SHEET 7 OF 23


LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5700
5690
5680
5670
5660
5650
3001
3002
3003.1
3003.2 County Rd 21
3004
3005
Trib Confluence
3006
3007.1
3007.2 Private Rd
3008
3009
3010.1
3010.2
3011
County Rd 250
5730
5720
5710
5700
5740
5750
5760
5770
5780
5790
5800
5810
5820
5830
90+00
98+00
106+00
114+00
122+00
130+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO
SIXTEENTH ST WATERSHED
SHEET 8 OF 23


LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5880
5870
5860
5850
5840
5830
5820
3013
3014 Upper Study Limit
3012
3011
5940
5930
5920
5910
5900
5890
128+00
136+00
144+00
152+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO
SIXTEENTH ST WATERSHED
SHEET 9 OF 23

LEGEND

500 YEAR FLOOD

100 YEAR FLOOD

50 YEAR FLOOD

10 YEAR FLOOD

STREAM BED

ELEVATION IN FEET (M.S.L.)

5810
5800
5790
5780
5770
5760

3016
3015
3017
3018
3019
3020
3005 Tributary
Upper study limit

5820
5860
5870
5910
5950
5980
6030
5850
5900
5940
5970
5840
5890
5930
5960
5830
5880
5920
5820
5870
5910

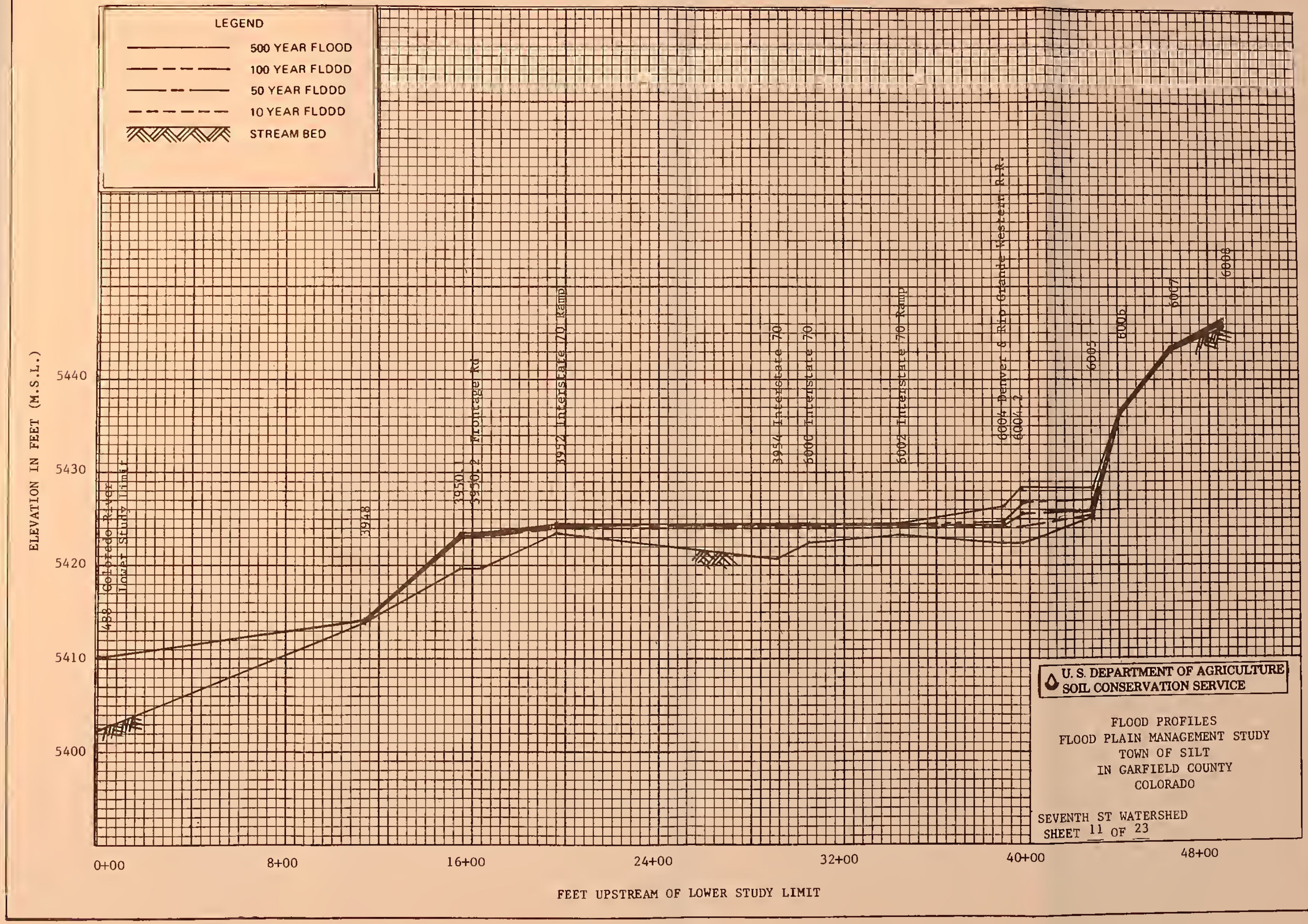
FEET UPSTREAM OF LOWER STUDY LIMIT

116+00
124+00
132+00
140+00
148+00
156+00
164+00

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

SIXTEENTH ST WATERSHED
SHEET 10 OF 23


LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5440
5430
5420
5410
5400
488 Colorado River
Lower Study Limit
3948
3950.1
3950.2 Frontage Rd
3952 Interstate 70 Ramp
3954 Interstate 70
6000 Interstate 70
6002 Interstate 70 Ramp
6004 Denver & Rio Grande Western R.R.
6004.2
6005
6006
6007
6008
0+00
8+00
16+00
24+00
32+00
40+00
48+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO
SEVENTH ST WATERSHED
SHEET 11 OF 23

LEGEND

500 YEAR FLOOD

100 YEAR FLOOD

50 YEAR FLOOD

10 YEAR FLOOD

STREAM BED

ELEVATION IN FEET (M.S.L.)

5490
5480
5470
5460
5450
5440

6008
6009 Grand Ave
6010 Bellaire Ave
6015 Orchard Ave
6016
6018 Upper Study Limit

5530
5520
5510
5500
5490

48+00
56+00
64+00
72+00
80+00

FEET UPSTREAM OF LOWER STUDY LIMIT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

SEVENTH ST WATERSHED
SHEET 12 OF 23

LEGEND

500 YEAR FLOOD

100 YEAR FLOOD

50 YEAR FLOOD

10 YEAR FLOOD

STREAM BED

ELEVATION IN FEET (M.S.L.)

5430

5420

5410

5400

408 Colorado River
Lower Study Limit

1948

3950.1 Interstate 70 Frontage Rd.

3950.2 Interstate 70 Ramp

1952 Interstate 70

3954 Interstate 70

3956

3958 Interstate 70 Ramp

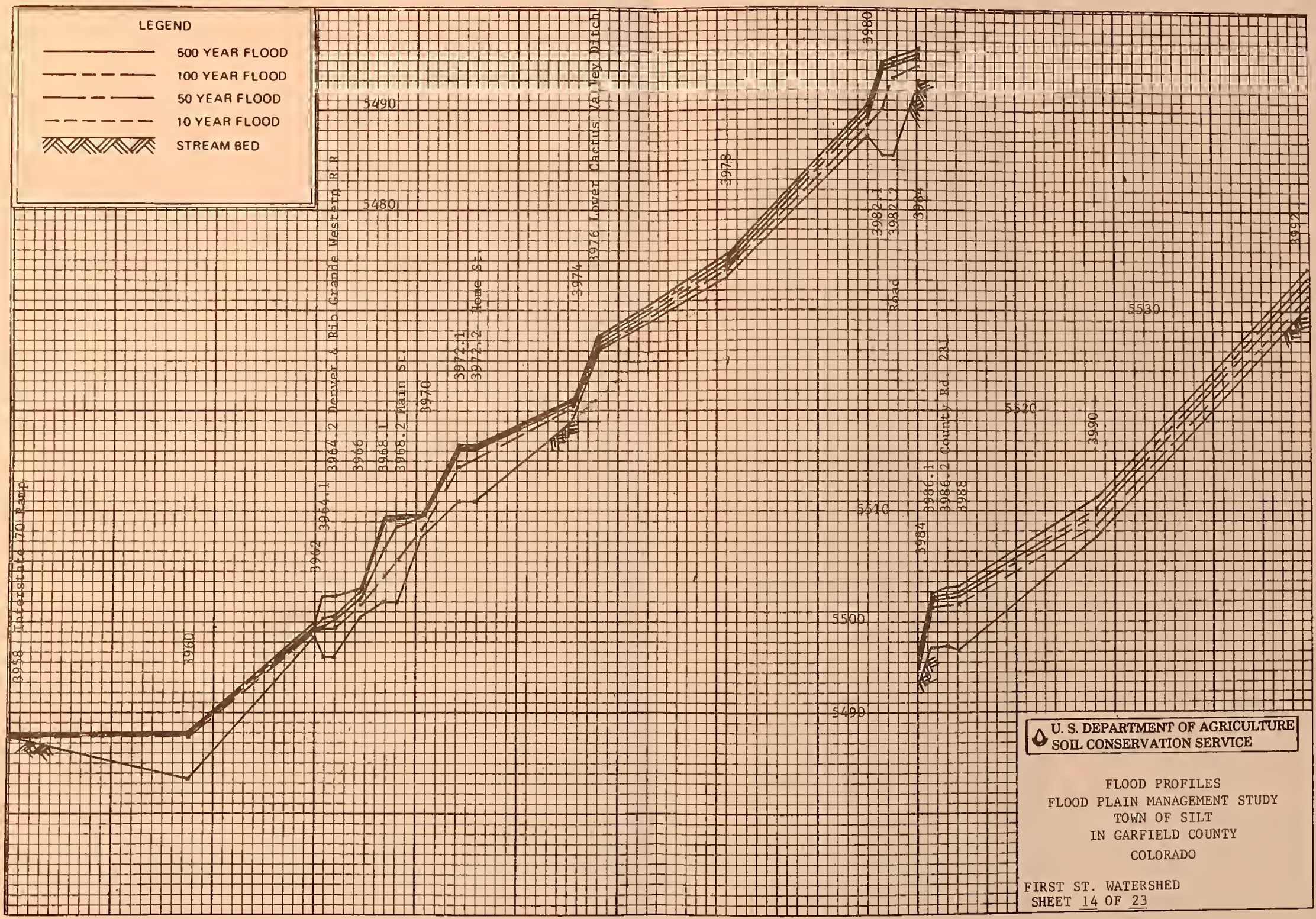
0+00 8+00 16+00 24+00 32+00 40+00 48+00

FEET UPSTREAM OF LOWER STUDY LIMIT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

FIRST ST WATERSHED
SHEET 13 OF 23


LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5470
5460
5450
5440
5430
5420
5490
5480
5530
5520
5510
5500
5490
3958 Interstate 70 Ramp
3960
3962
3964.1
3964.2 Denver & Rio Grande Western R.R.
3966
3968.1
3968.2 Main St.
3970
3972.1
3972.2 Home St.
3974
3976 Lower Cactus Valley Ditch
3978
3980
3982.1
3982.2
3984
Road
3990
3992
3986.1
3986.2
3988
County Rd. 23
47+00
55+00
63+00
71+00
79+00
87+00
95+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO
FIRST ST. WATERSHED
SHEET 14 OF 23

LEGEND

500 YEAR FLOOD

100 YEAR FLOOD

50 YEAR FLOOD

10 YEAR FLOOD

STREAM BED

ELEVATION IN FEET (M.S.L.)

5580
5570
5560
5550
5540
5530

5590
5600
5610
5620
5630
5640
5650
5660

3992
3994
3996.1
3996.2 Private Rd
3998
4000
4001
4002
4004.1
4004.2 Road
4006
4007

98+00
106+00
114+00
122+00
130+00
138+00
146+00

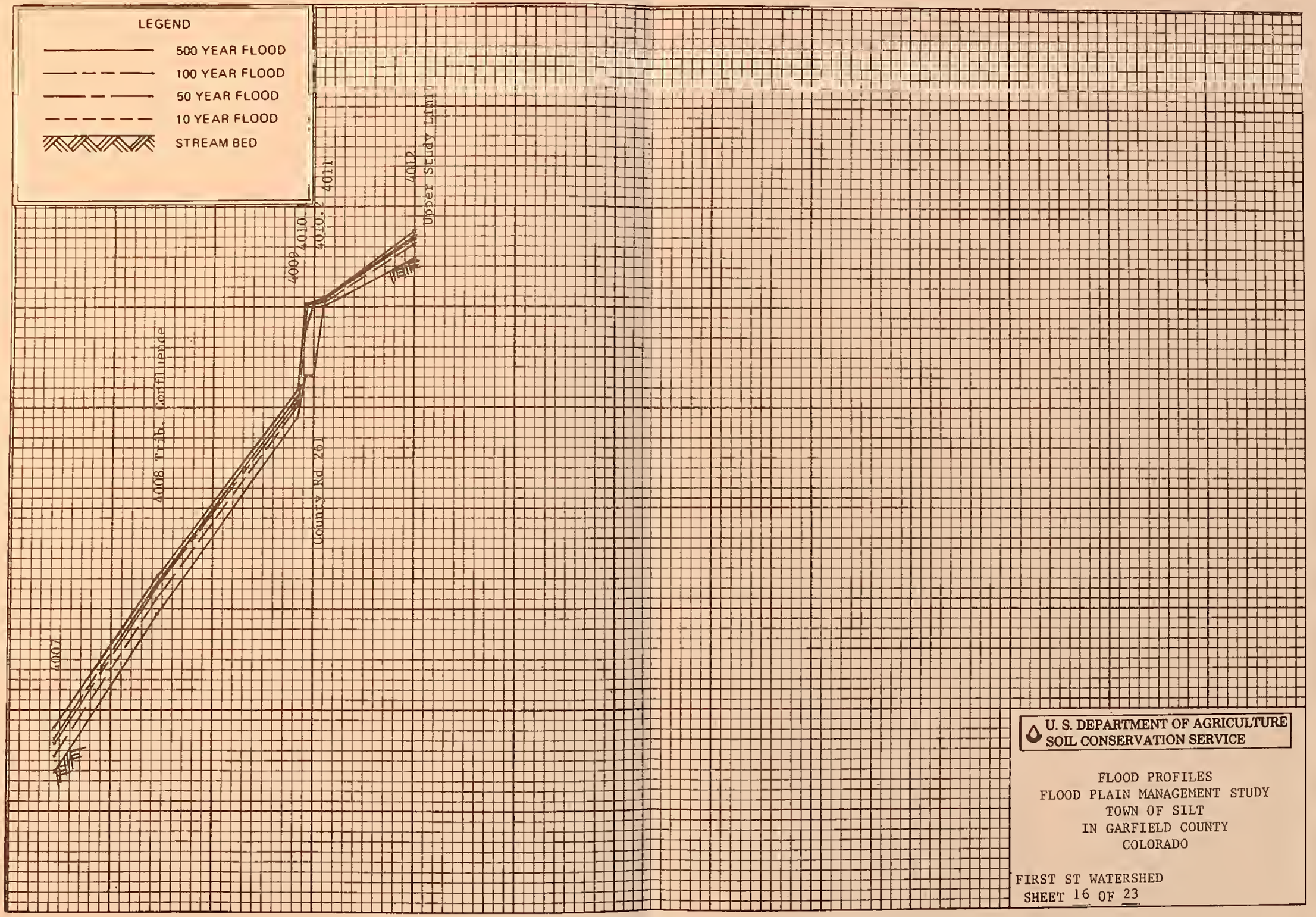
FEET UPSTREAM OF LOWER STUDY LIMIT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

FIRST ST WATERSHED

SHEET 15 OF 23



U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

FIRST ST WATERSHED
SHEET 16 OF 23

LEGEND

500 YEAR FLOOD

100 YEAR FLOOD

50 YEAR FLOOD

10 YEAR FLOOD

STREAM BED

ELEVATION IN FEET (M.S.L.)

5730

5720

5710

5700

5690

5680

4014

5740

4013

4016

5830

5820

4013

5810

5780

5800

5770

4008 Tributary

5760

4014

5790

4015

5750

5780

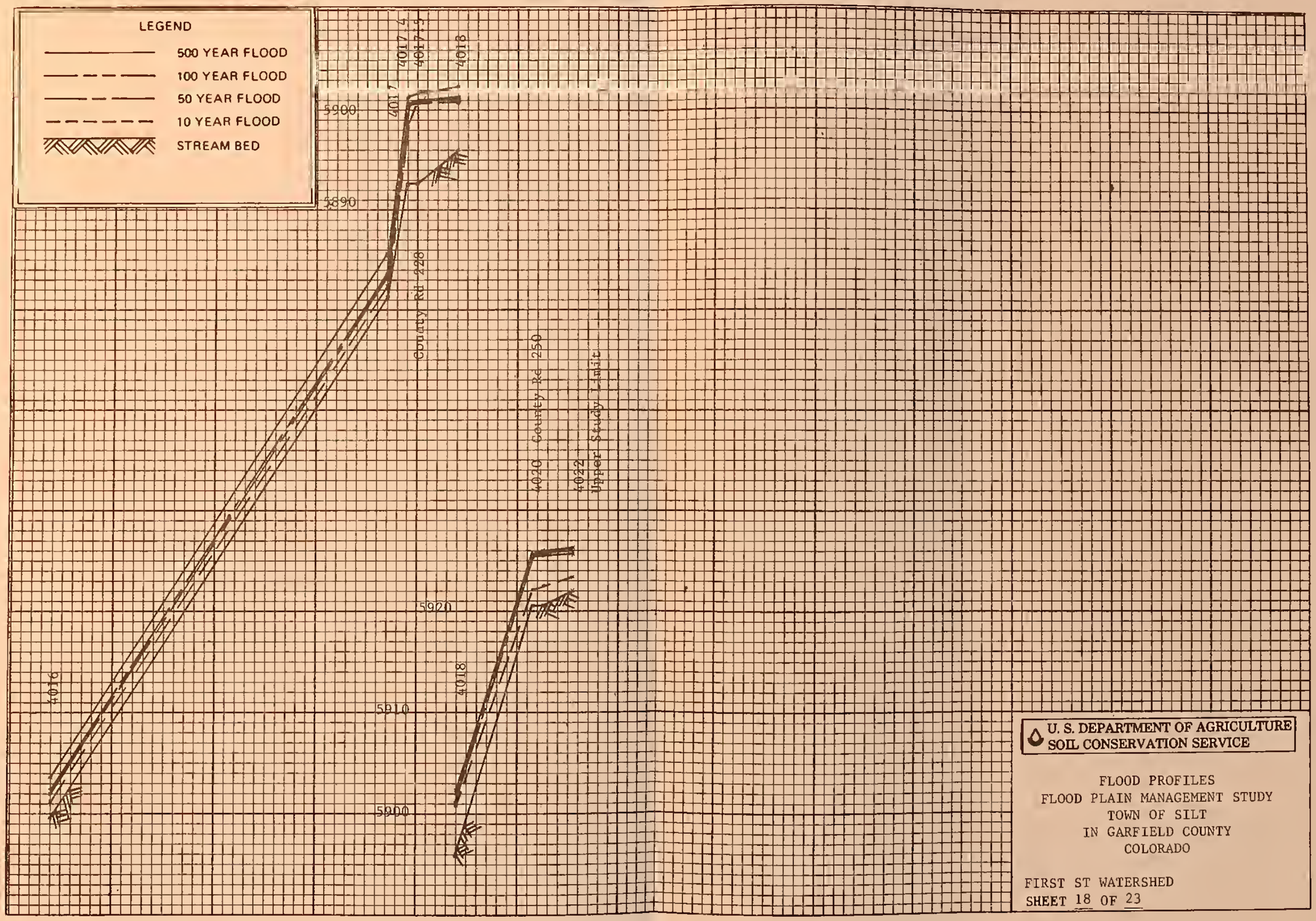
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

FIRST ST WATERSHED
SHEET 17 OF 23

150+00 158+00 166+00 174+00 182+00 190+00

FEET UPSTREAM OF LOWER STUDY LIMIT


LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5900
5890
5880
5870
5860
5850
5840
5830
4017.4
4017.2
4018
4017
County Rd 228
4020 County Rd 250
4022
Upper Study Limit
4016
4018
5920
5910
5900
190+00
198+00
206+00
214+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO
FIRST ST WATERSHED
SHEET 18 OF 23

LEGEND

500 YEAR FLOOD

100 YEAR FLOOD

50 YEAR FLOOD

10 YEAR FLOOD

STREAM BED

ELEVATION IN FEET (M.S.L.)

5430
5420
5410
5400
5390
5380

Colorado River
Lower Study Limit

4981
4978
4980
4986.1
Denver & Rio Grande Western R.R.
4986.2
4988
Main Street
4990
4990
4992
4994.1
4994.2
4996
Bridge

5490
5480
5470
5460
5450
5440
5430

0+00
8+00
16+00
24+00
32+00
40+00

FEET UPSTREAM OF LOWER STUDY LIMIT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

WEST WATERSHED
SHEET 19 OF 23

LEGEND

500 YEAR FLOOD

100 YEAR FLOOD

50 YEAR FLOOD

10 YEAR FLOOD

STREAM BED

ELEVATION IN FEET (M.S.L.)

5520
5510
5500
5490
5480
5470

4996
4998
5000
5001
5002
5530
5540
5550
5560
5570
5580

40+00
48+00
56+00
64+00
72+00
80+00

FEET UPSTREAM OF LOWER STUDY LIMIT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

WEST WATERSHED
SHEET 20 OF 23

LEGEND

500 YEAR FLOOD

100 YEAR FLOOD

50 YEAR FLOOD

10 YEAR FLOOD

STREAM BED

ELEVATION IN FEET (M.S.L.)

5640
5630
5620
5610
5600
5590
5580

5004
5005.1
5005.2
Co. Rd. 233
5006
5007
5003
5007
5009
5008
5007

5690
5680
5670
5660
5650

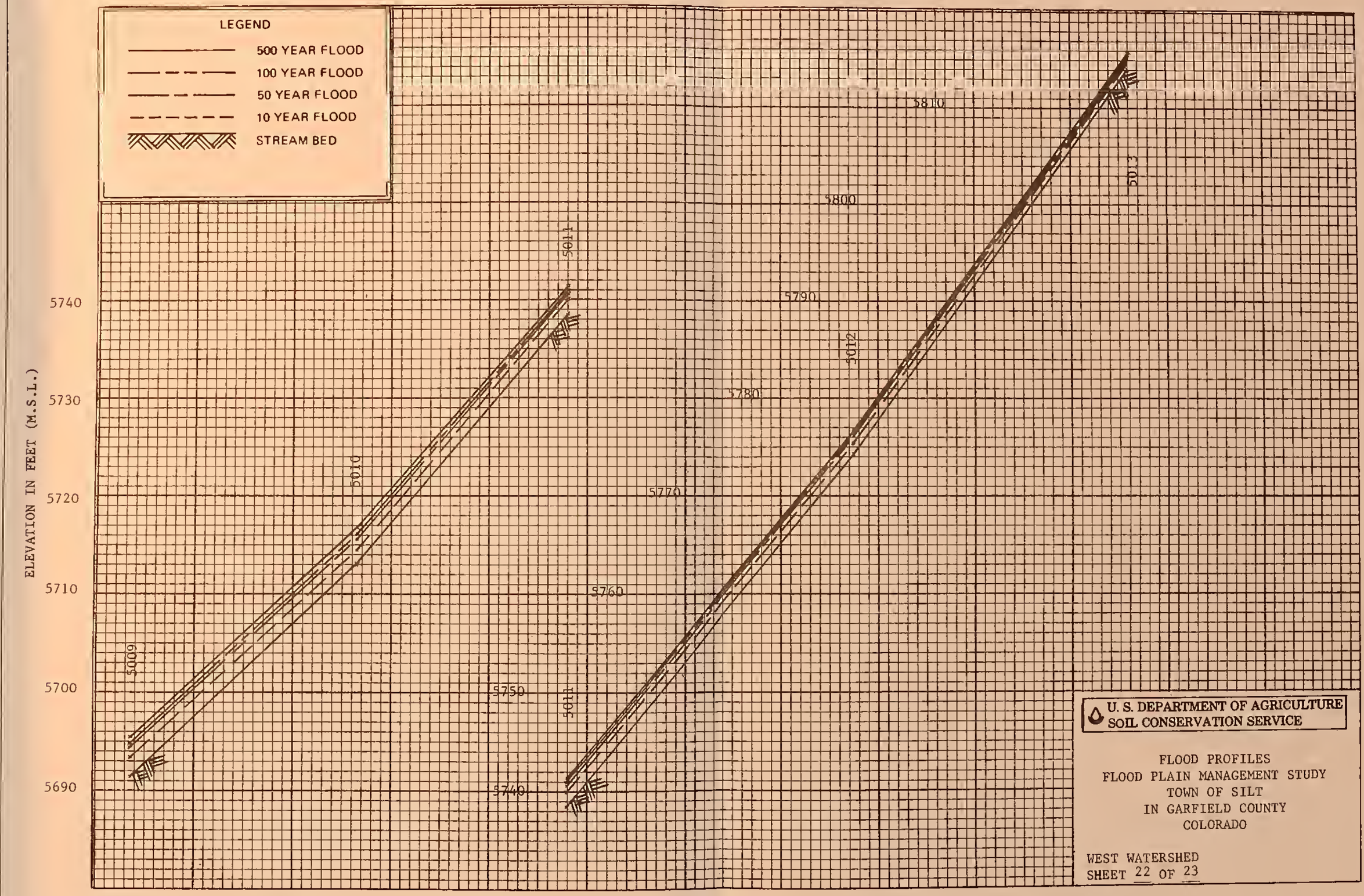
84+00
92+00
100+00
108+00
116+00
124+00

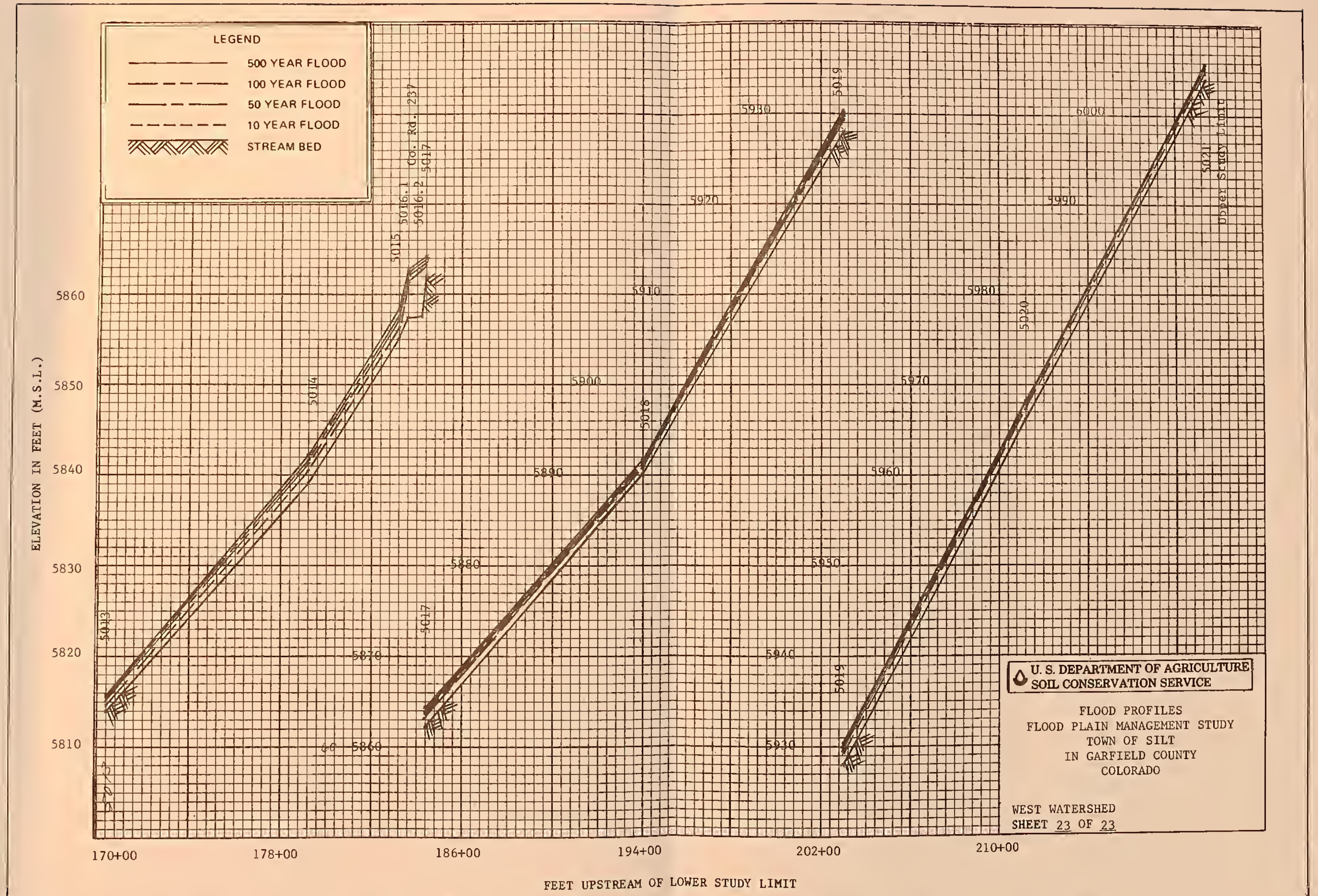
FEET UPSTREAM OF LOWER STUDY LIMIT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

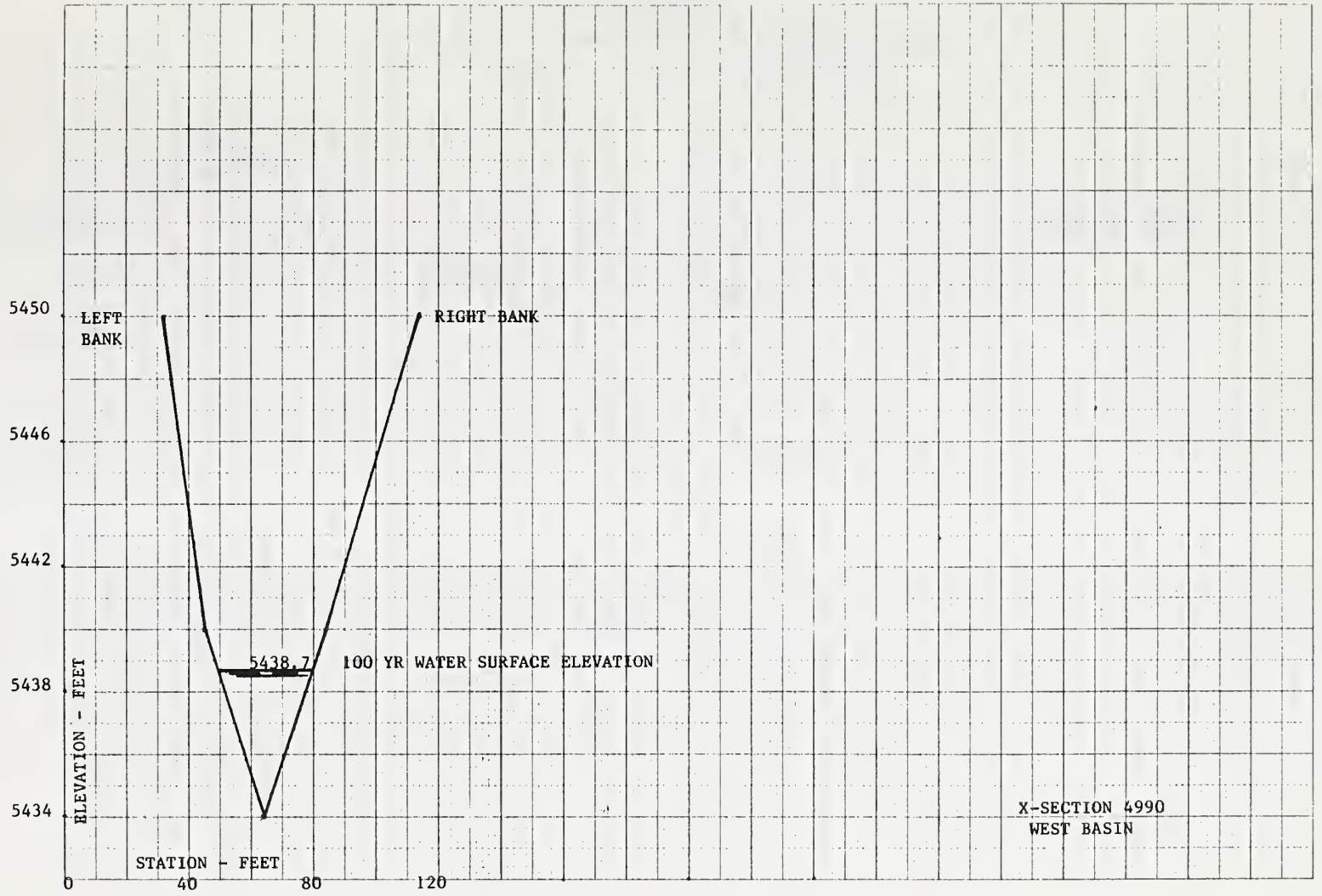
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO

WEST WATERSHED
SHEET 21 OF 23


LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5740
5730
5720
5710
5700
5690
5800
5790
5780
5770
5760
5750
5740
5013
5010
5009
5012
5011
128+00
136+00
144+00
152+00
160+00
168+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO
WEST WATERSHED
SHEET 22 OF 23


LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5860
5850
5840
5830
5820
5810
5910
5900
5890
5880
5870
5860
5930
5920
5990
5980
5970
5960
5950
5940
6000
5930
5016.1
5016.2
5017
Co. Rd. 237
Upper Study Limit
5013
5014
5015
5016
5017
5018
5019
5020
5021
170+00
178+00
186+00
194+00
202+00
210+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
TOWN OF SILT
IN GARFIELD COUNTY
COLORADO
WEST WATERSHED
SHEET 23 OF 23

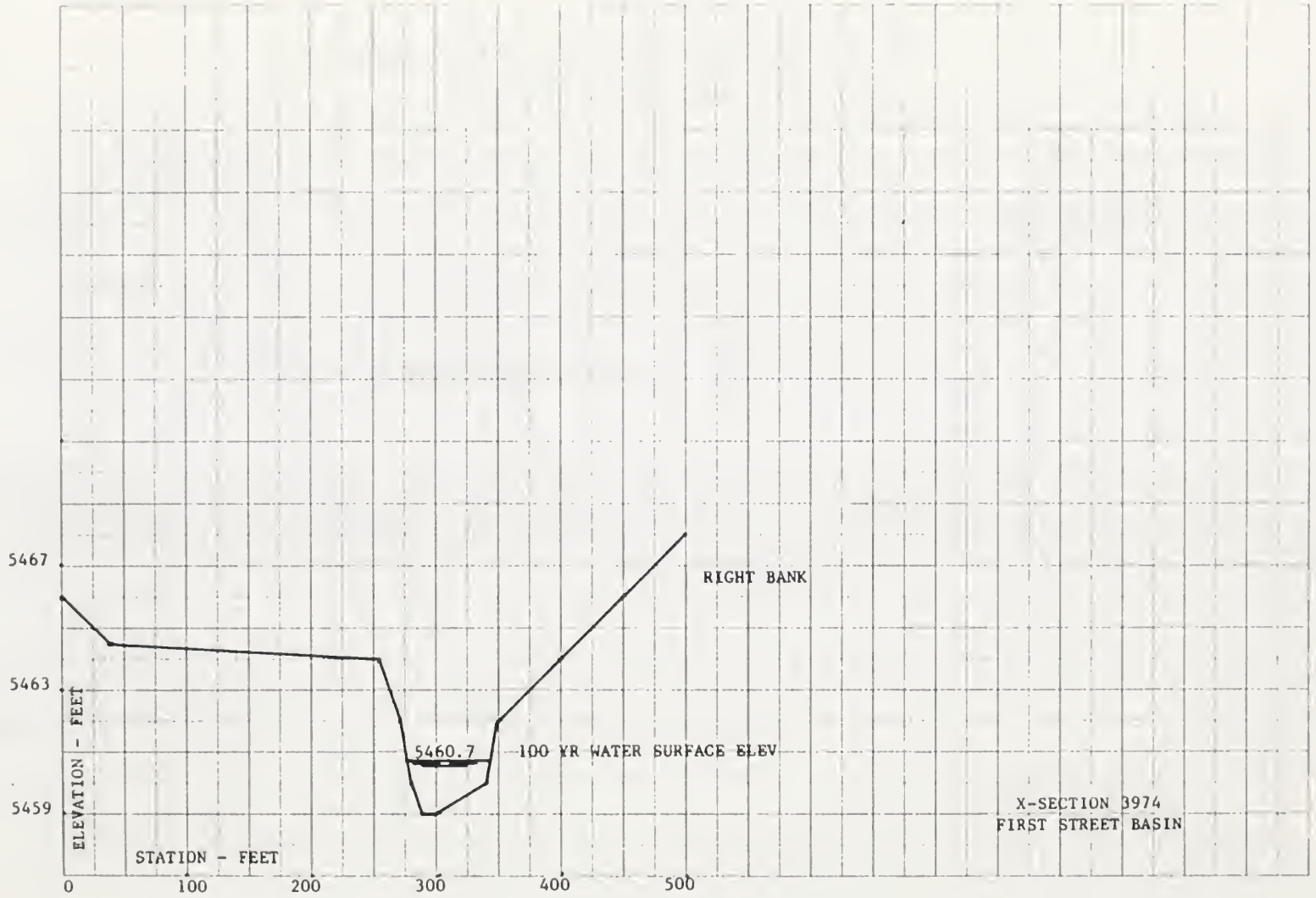
K+E 10 X 10 TO 1 INCH 7 X 10 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.



TYPICAL VALLEY CROSS-SECTION

TOWN OF SILT FLOOD PLAIN MANAGEMENT STUDY

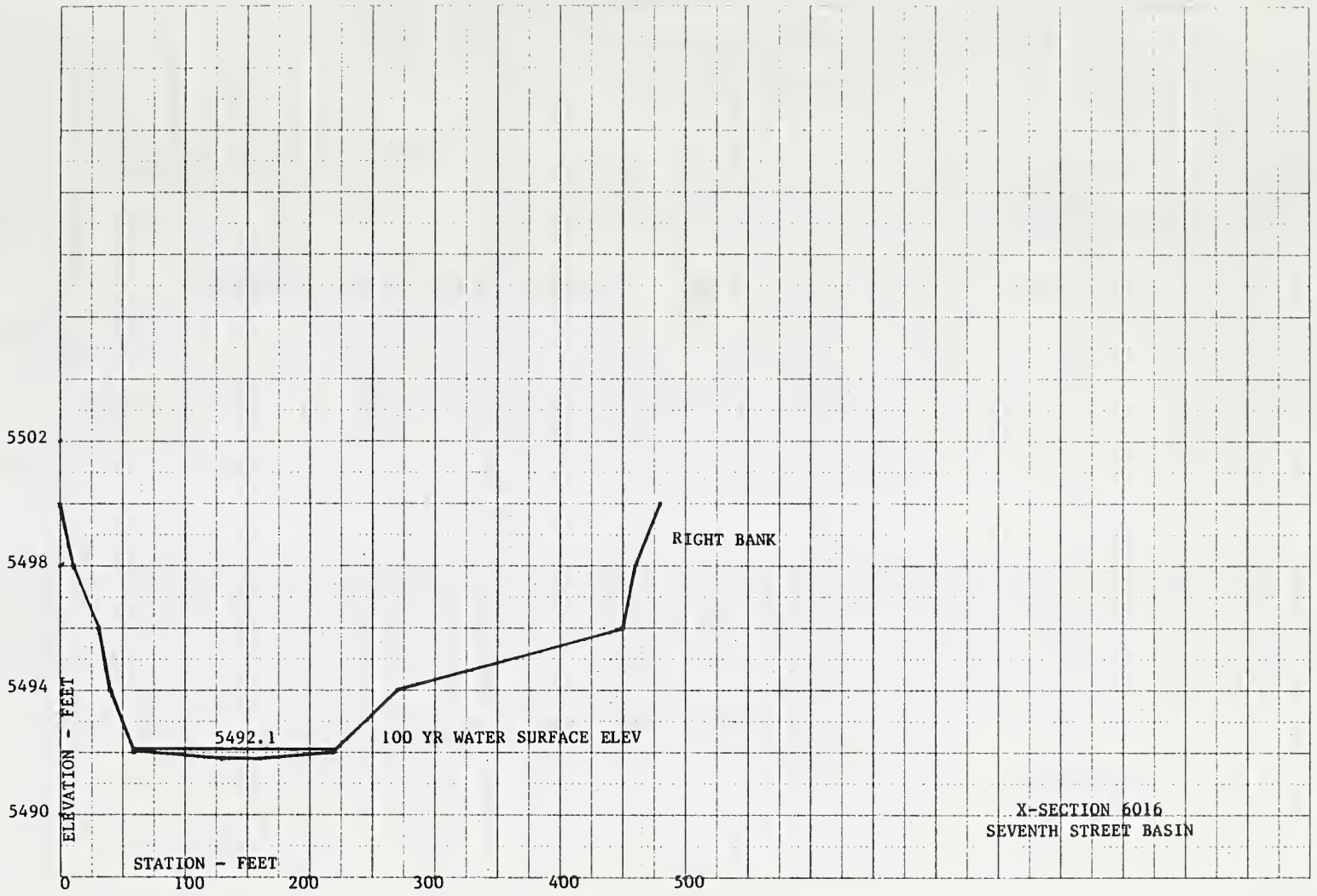
Figure 1



TYPICAL VALLEY CROSS-SECTION

TOWN OF SILT FLOOD PLAIN MANAGEMENT STUDY

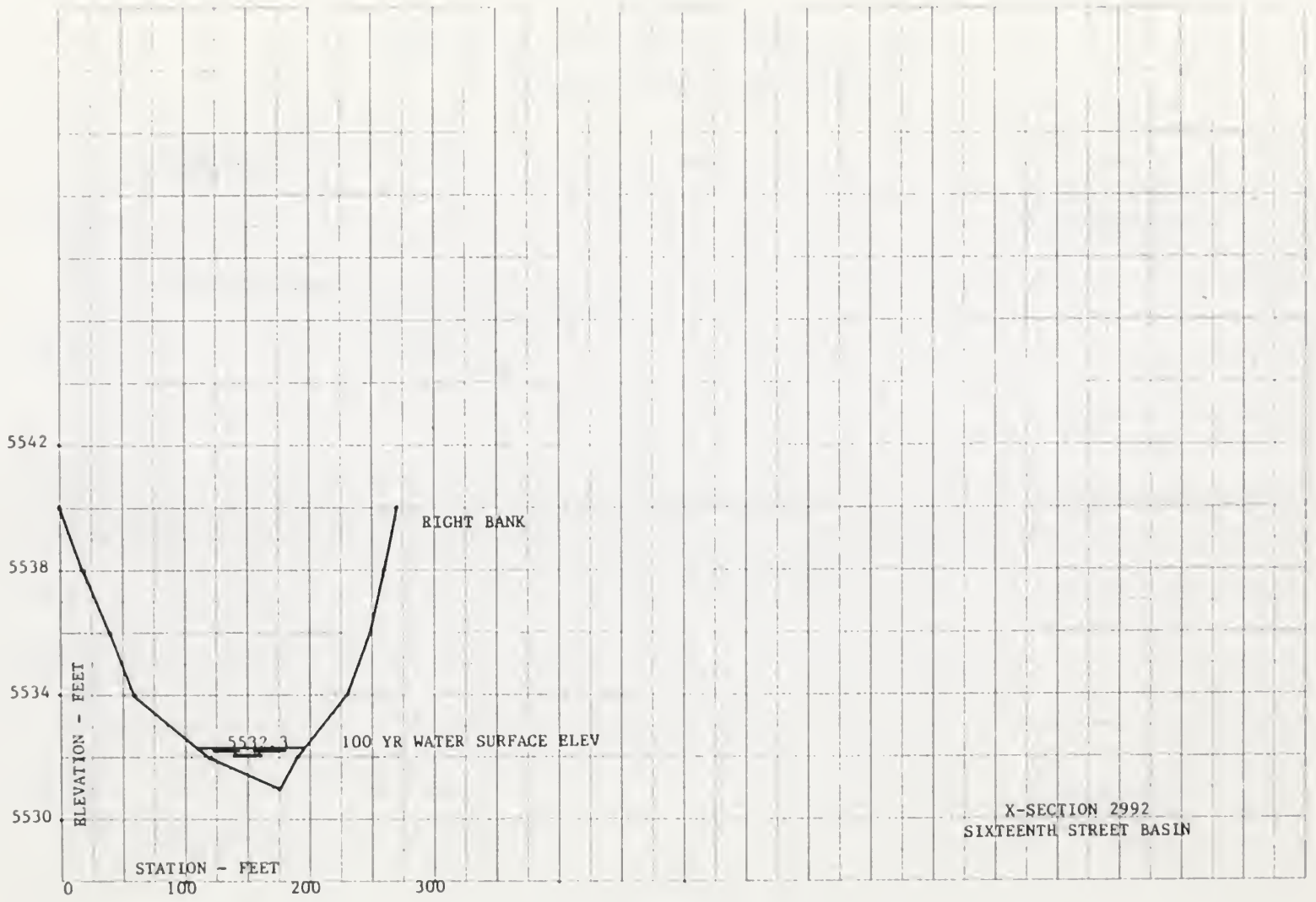
Figure 2



TYPICAL VALLEY CROSS-SECTION

TOWN OF SILT FLOOD PLAIN MANAGEMENT STUDY

Figure 3

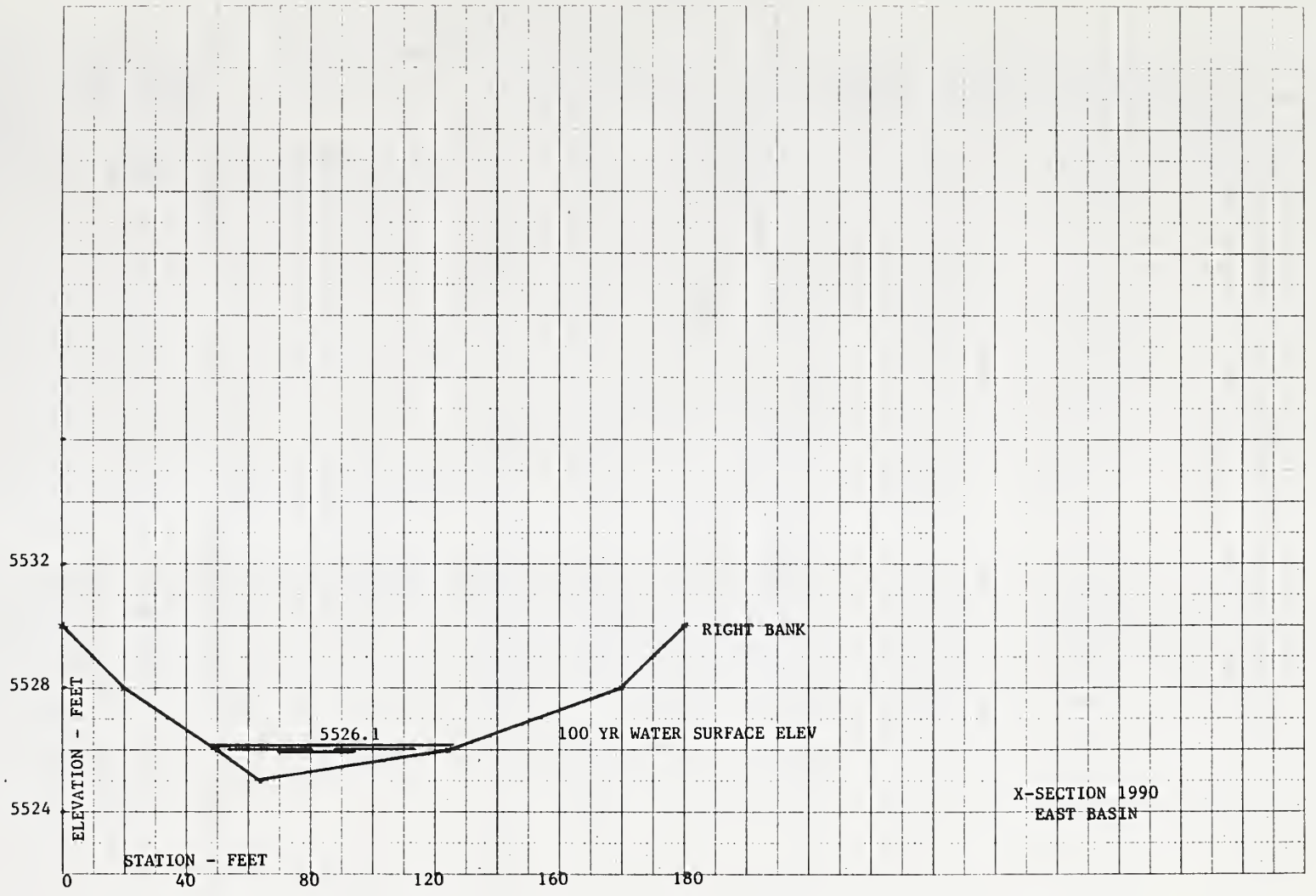


TYPICAL VALLEY CROSS-SECTION

TOWN OF SILT FLOOD PLAIN MANAGEMENT STUDY

Figure 4

K+E 10 X 10 TO INCH KEUFFEL & ESSER CO



TYPICAL VALLEY CROSS-SECTION

TOWN OF SILT FLOOD PLAIN MANAGEMENT STUDY

Figure 5

TABLE 1 FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA *

Cross Section Design-nation	Stationing from Mouth Feet	Identification	Stream Bed Elevation Feet	Crest-Elevation and Peak Discharge c.f.s. 10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
513 #	0+00	Colorado River at East Watershed	5417.7	5426.7 20100	5426.7 20100	5426.7 20100	5426.7 20100
1970	5+20		5426.9	5429.1 96	5429.2 279	5429.2 381	5429.2 658
1972.1	6+50		5430.5	5431.7 96	5432.7 279	5433.0 381	5433.5 658
1972.2	7+98	Interstate 70	5430.5	5432.8 96	5433.8 279	5434.2 381	5434.9 658
1974.1	19+78		5438.0	5440.2 96	5441.7 279	5441.8 381	5442.1 658
1974.2	20+38	Denver & Rio Grande Western R.R.	5438.0	5440.4 96	5441.8 279	5441.9 381	5442.2 658
1976	21+53		5438.0	5441.4 96	5441.9 279	5442.0 381	5442.3 658
1978	26+08		5443.8	5444.1 96	5444.2 279	5444.3 381	5444.5 658
1980.1	26+58		5447.3	5449.8 96	5450.1 279	5450.2 381	5450.3 658
1980.2	27+08	U.S. Highway 6 Main St	5447.3	5449.9 96	5450.3 279	5450.4 381	5450.7 658
1982	34+58		5450.0	5452.4 59	5453.3 162	5453.6 215	5454.2 352
1984	39+88	Lower Castle Valley Ditch	5471.5	5471.9 59	5472.1 162	5472.2 215	5472.4 352
1986	44+88		5487.0	5487.4 59	5487.6 162	5487.7 215	5487.8 352

* Flood elevations pertain to the primary channel and usually remain constant in a lateral direction across the flood plain. However, flood elevations in the outer portions of a cross section may differ from the primary channel due to road crossings, upstream diversions, etc.

\# Discharge in Colorado River at 25 year frequency
Divided flow exists with 2/3 of discharge at this location

TABLE 1 FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA *

Cross Section Design-nation	Stationing from Mouth Feet	Identification	Stream Bed Elevation Feet	Crest-Elevation and Peak Discharge c.f.s. 10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
1988	50+48		5511.0	5511.4	5511.5	5511.6	5511.8
				59	162	215	352
1990	53+28		5525.0	5525.7	5526.0	5526.1	5526.4
				59	162	215	352
1992	64+78		5568.0	5568.4	5568.7	5568.8	5569.1
				59	162	215	352
1994	71+38		5593.0	5594.4	5595.0	5595.3	5595.8
				59	162	215	352
1996.1	71+78		5595.0	5597.9	5599.5	5599.7	5600.1
				59	162	215	352
1996.2	72+08	Road	5595.0	5599.3	5599.9	5600.1	5600.6
				59	162	215	352
1998	72+28		5596.0	5599.4	5600.1	5600.3	5600.9
				59	162	215	352
2000	78+28		5618.5	5619.5	5620.1	5620.2	5620.6
				59	162	215	352
2001	87+58		5653.3	5654.3	5654.8	5655.0	5655.4
				59	162	215	352
2002	94+18		5671.9	5674.0	5675.0	5675.3	5676.1
				59	162	215	352
2003	94+78		5680.0	5680.7	5681.1	5681.3	5681.7
				59	162	215	352
2004	103+28		5709.8	5710.7	5711.3	5711.5	5712.0
				62	161	210	337
2005	113+38		5749.8	5750.5	5750.9	5751.1	5751.4
				62	161	210	337

* Flood elevations pertain to the primary channel and usually remain constant in a lateral direction across the flood plain. However, flood elevations in the outer portions of a cross section may differ from the primary channel due to road crossings, upstream diversions, etc.

TABLE 1 FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA *

Cross Section Design-nation	Stationing from Mouth Feet	Identification	Stream Bed Elevation Feet	Crest-Elevation and Peak Discharge c.f.s. 10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
2006	119+58		5776.0	5776.4	5776.7	5776.8	5777.1
				62	161	210	337
2007.1	119+78		5776.5	5778.9	5780.9	5781.8	5784.2
				62	161	210	337
2007.2	120+08	County Rd 214	5776.5	5780.3	5780.9	5781.8	5784.2
				62	161	210	337
2008	120+28		5782.0	5782.5	5783.3	5784.4	5784.5
				62	161	210	337
2009	131+88		5823.5	5824.2	5824.6	5824.7	5825.0
				62	161	210	337
2010	143+48		5870.2	5871.6	5872.3	5872.5	5873.0
				62	161	210	337
2011	153+48	Confluence with Tributary	5913.9	5915.0	5915.5	5915.6	5916.0
				62	161	210	337
2012	160+28		5939.8	5940.8	5941.3	5941.4	5941.8
				22	64	83	135
2013	166+08	Upper Study Limit	5963.2	5964.0	5964.4	5964.5	5964.9
				22	64	83	135

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TABLE 1 FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA *

Cross Section Design-nation	Stationing from Mouth Feet	Identification	Stream Bed Elevation Feet	Crest-Elevation and Peak Discharge c.f.s. 10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
2011	153+48	East Watershed Trib	5913.9	5915.0	5915.5	5915.6	5916.0
				62	161	210	337
2014	161+08		5948.8	5950.1	5950.7	5950.9	5951.4
				63	150	190	297
2015	168+68		5984.0	5985.6	5986.3	5986.5	5987.0
				63	150	190	297
2016	178+38		6032.1	6033.7	6034.3	6034.5	6035.0
				63	150	190	297
2017	187+18		6080.0	6081.6	6082.2	6082.4	6082.8
				69	152	190	289
2018	196+58	Upper Study Limit	6128.2	6129.7	6130.3	6130.5	6130.9
				69	152	190	289

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TABLE 1 FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA *

Cross Section Design-nation	Stationing from Mouth Feet	Identification	Stream Bed Elevation Feet	Crest-Elevation and Peak Discharge c.f.s. 10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
513 #	0+00	Colorado River at Sixteenth St Watersh	5417.7	5426.7 20100	5426.7 20100	5426.7 20100	5426.7 20100
1970	5+20	Sixteenth St Watershed	5426.9	5429.1 96	5429.2 279	5429.2 381	5429.2 657
1972.1	6+50		5430.5	5431.7 96	5432.7 279	5433.0 381	5433.5 657
1972.2	7+98	Interstate 70	5430.5	5432.8 96	5433.8 279	5434.2 381	5434.9 657
1974.1	19+78		5438.0	5440.2 96	5441.7 279	5441.8 381	5442.1 657
1974.2	20+38	Denver & Rio Grande Western R.R.	5438.0	5440.4 96	5441.8 279	5441.9 381	5442.2 657
1976	21+53		5438.0	5441.4 96	5441.9 279	5442.0 381	5442.3 657
1978	26+08		5443.8	5444.1 96	5444.2 279	5444.3 381	5444.5 657
1980.1	26+58		5447.3	5449.8 96	5450.1 279	5450.2 381	5450.3 657
1980.2	27+08	U.S. Hilghway 6 Main St	5447.3	5449.9 96	5450.3 279	5450.4 381	5450.7 657
2980	29+83		5453.5	5454.5 60	5455.1 178	5455.3 237	5455.7 397
2982	34+03		5459.0	5459.9 60	5460.3 178	5460.4 237	5460.7 397
2984	38+03	Lower Castle Valley Ditch	5469.0	5469.2 60	5469.4 178	5469.5 237	5469.7 397

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\# Discharge in Colorado River at 25 year frequency
Divided flow exists with 2/3 of discharge at this location

TABLE 1 FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA *

Cross Section Design-nation	Stationing from Mouth	Identification	Stream Bed Elevation	Crest-Elevation and Peak Discharge c.f.s.			
				10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
	Feet		Feet				
2986	42+33	Grand Ave	5479.7	5480.1	5480.2	5480.3	5480.4
				60	178	237	397
2988	47+33		5495.8	5497.0	5497.8	5498.1	5498.8
				60	178	237	397
2990	51+33		5507.0	5507.9	5508.1	5508.2	5508.5
				60	178	237	397
2992	56+73		5531.0	5531.8	5532.1	5532.3	5532.5
				74	197	257	420
2994	65+73		5560.5	5561.5	5562.0	5562.2	5562.6
				74	197	257	420
2996	73+93		5583.5	5584.4	5584.9	5585.1	5585.5
				74	197	257	420
2998	81+93		5608.5	5609.9	5610.6	5610.9	5611.5
				74	197	257	420
3000	91+93		5649.5	5650.5	5651.1	5651.3	5651.9
				74	197	257	420
3001	101+73		5702.0	5703.1	5703.7	5703.9	5704.2
				74	197	257	420
3002	108+73		5735.0	5735.7	5736.1	5736.2	5736.4
				74	197	257	420
3003.1	108+93		5736.0	5740.0	5743.5	5744.7	5744.8
				74	197	257	420
3003.2	109+33	County Rd 214	5736.0	5744.0	5744.5	5745.0	5745.2
				74	197	257	420
3004	109+58		5739.5	5744.5	5744.7	5745.0	5745.2
				74	197	257	420

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TABLE 1 FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA *

Cross Section Design-nation	Stationing from Mouth Feet	Identification	Stream Bed Elevation Feet	Crest-Elevation and Peak Discharge c.f.s. 10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
3005	116+58	Tributary confluence	5759.4	5760.5 74	5761.2 197	5761.5 257	5762.1 420
3006	122+98		5796.0	5796.6 5	5797.1 25	5797.3 39	5797.7 79
3007.1	123+88		5806.5	5807.6 5	5809.8 25	5809.9 39	5810.1 79
3007.2	124+28	Private Rd	5806.5	5808.4 5	5809.9 25	5810.1 39	5810.2 79
3008	125+28		5808.0	5808.6 5	5810.0 25	5810.1 39	5810.4 79
3009	127+48		5816.0	5816.6 5	5817.1 25	5817.3 39	5817.7 79
3010.1	128+23		5822.5	5823.2 5	5824.5 25	5825.1 39	5826.7 79
3010.2	128+58	County Rd 250	5822.5	5823.4 5	5825.7 25	5828.7 39	5829.4 79
3011	129+18		5825.0	5825.5 5	5826.5 25	5829.0 39	5830.1 79
3012	132+88		5840.0	5840.3 5	5840.7 25	5840.9 39	5841.4 79
3013	142+88		5895.0	5895.5 5	5896.0 25	5896.2 39	5896.7 79
3014	151+38	Upper Study Limit	5939.9	5940.1 5	5940.4 25	5940.6 39	5940.9 79

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TABLE 1 FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA *

Cross Section Designation	Stationing from Mouth Feet	Identification	Stream Bed Elevation Feet	Crest-Elevation and Peak Discharge c.f.s. 10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
3005	116+58	Sixteenth St Trib	5759.4	5760.5	5761.2	5761.5	5762.1
				74	197	257	420
3015	126+58		5799.7	5801.0	5801.7	5801.9	5802.4
				71	186	242	391
3016	132+38		5821.7	5822.8	5823.6	5823.9	5824.5
				71	186	242	391
3017	142+58		5870.0	5871.4	5872.4	5872.7	5873.5
				70	166	211	329
3018	152+38		5915.0	5916.4	5917.0	5917.3	5917.9
				70	166	211	329
3019	159+38		5854.3	5855.5	5956.0	5856.2	5956.6
				70	166	211	329
3020	168+58	Upper Study Limit	6003.5	6004.4	6004.9	6005.1	6005.5
				70	166	211	329

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TABLE 1 FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA *

Cross Section Design-nation	Stationing from Mouth Feet	Identification	Stream Bed Elevation Feet	Crest-Elevation and Peak Discharge c.f.s. 10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
488 #	0+00	Colorado River at Seventh St Watershed	5402.5	5410.2 10100	5410.2 10100	5410.2 10100	5410.2 10100
3948	11+40	Seventh St Watershed	5413.9	5414.0 60	5414.0 101	5414.1 139	5414.1 300
3950.1	15+50		5419.8	5422.2 60	5422.9 101	5423.1 139	5423.3 300
3950.2	16+40	Frontage Rd	5419.8	5423.0 60	5423.2 101	5423.4 139	5423.4 300
3952	19+60	Interstate 70 Ramp	5423.5	5424.0 60	5424.1 101	5424.2 139	5424.4 300
3954	29+10	Interstate 70	5420.8	5424.0 60	5424.1 101	5424.2 139	5424.5 300
6000	30+50	Interstate 70	5422.5	5424.0 6	5424.1 32	5424.2 53	5424.5 114
6002	34+30	Interstate 70 Ramp	5423.2	5424.0 6	5424.1 32	5424.2 53	5424.5 114
6004	38+90		5422.5	5424.0 6	5424.2 32	5424.8 53	5426.4 114
6004.2	39+70	Denver & Rio Grande Western R.R.	5422.5	5424.0 6	5425.3 32	5426.9 53	5428.3 114
6005	42+90	East Segment of Divided flow reach	5425.0	5425.3 2	5426.0 9	5427.2 13	5428.3 28
6006	44+10		5436.3	5436.5 2	5436.6 9	5436.7 13	5436.9 28
6007	46+30		5443.0	5443.2 2	5443.3 9	5443.4 13	5443.5 28

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\# Discharge in Colorado River at 25 year frequency
Divided flow exists with 1/3 of discharge at this location

TABLE 1 FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA *

Cross Section Designation	Stationing from Mouth Feet	Identification	Stream Bed Elevation Feet	Crest-Elevation and Peak Discharge c.f.s. 10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
6008	48+60		5445.8	5446.0	5446.2	5446.3	5446.5
				2	9	13	28
6009	52+60	Grand Ave	5454.8	5454.9	5454.9	5454.9	5455.0
				2	9	13	28
6010	55+80	Ballard Ave	5461.5	5461.6	5461.7	5461.8	5461.9
				2	9	13	28
6015	59+20	Orchard Ave End Divided Flow	5474.1	5474.2	5474.3	5474.3	5474.4
				5	27	40	84
6004.2	39+70	Denver & Rio Grande Western R.R.	5422.5	5424.0	5425.3	5426.9	5428.3
				6	32	53	114
6011	44+10	West Segment of Divided flow reach	5442.0	5442.2	5442.4	5442.5	5442.6
				3	18	27	56
6012	47+10	Home Ave	5449.5	5449.7	5449.8	5449.8	5449.9
				3	18	27	56
6013	50+40	Grand Ave	5455.5	5455.7	5455.9	5456.0	5456.2
				3	18	27	56
6014	55+40	Lower Cactus Valley Ditch	5469.0	5469.1	5469.1	5469.1	5469.1
				3	18	27	56
6015	58+80	Orchard Ave End Divided Flow	5474.1	5474.2	5474.3	5474.3	5474.4
				5	27	40	84
6016	64+00		5491.8	5491.9	5492.0	5492.1	5492.2
				5	27	40	84
6018	74+40	Upper Study Limit	5531.5	5531.8	5532.1	5532.2	5532.5
				5	27	40	84

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TABLE 1 FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA *

Cross Section Design-nation	Stationing from Mouth Feet	Identification	Stream Bed Elevation Feet	Crest-Elevation and Peak Discharge c.f.s. 10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
488 #	0+00	Colorado River at First St Watershed	5402.5	5410.2 10100	5410.2 10100	5410.2 10100	5410.2 10100
3948	11+40	First St Watershed	5413.9	5414.0 60	5414.0 101	5414.1 139	5414.1 300
3950.1	15+50		5419.8	5422.2 60	5422.9 101	5423.1 139	5423.3 300
3950.2	16+40	Frontage Rd	5419.8	5423.0 60	5423.2 101	5423.4 139	5423.4 300
3952	19+60	Interstate 70 Ramp	5423.5	5424.0 60	5424.1 101	5424.2 139	5424.4 300
3954	29+10	Interstate 70	5420.8	5424.0 60	5424.1 101	5424.2 139	5424.5 300
3956	39+40		5421.5	5424.0 58	5424.1 98	5424.2 143	5424.4 305
3958	47+00	Interstate 70 Ramp	5427.4	5427.6 58	5427.6 98	5427.7 143	5427.8 305
3960	54+00		5423.5	5427.7 58	5427.7 98	5427.8 143	5428.1 305
3962	59+00		5437.5	5438.1 58	5438.2 98	5438.4 143	5438.8 305
3964.1	59+30		5435.7	5438.5 58	5438.7 98	5439.5 143	5441.7 305
3964.2	59+73	Denver & Rio Grande Western R.R.	5435.7	5438.6 58	5439.4 98	5439.7 143	5441.8 305
3966	60+80		5439.5	5440.9 58	5441.4 98	5442.1 143	5442.3 305

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Discharge in Colorado River at 25 year frequency
Divided flow exists with 1/3 of discharge at this location

TABLE 1 FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA *

Cross Section Design-nation	Stationing from Mouth Feet	Identification	Stream Bed Elevation Feet	Crest-Elevation and Peak Discharge c.f.s. 10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
3968.1	61+70		5441.0	5443.8	5446.4	5449.0	5449.2
				64	178	250	463
3968.2	62+30	Main St	5441.0	5445.2	5448.9	5449.1	5449.4
				64	178	250	463
3970	63+20		5447.5	5448.1	5449.3	5449.4	5449.7
				64	178	250	463
3972.1	64+70		5451.0	5454.5	5456.2	5456.3	5456.5
				64	178	250	463
3972.2	65+32	Home Ave	5451.0	5456.2	5456.3	5456.4	5456.7
				64	178	250	463
3974	69+20		5459.0	5459.7	5460.5	5460.7	5461.2
				64	178	250	463
3976	70+20	Lower Cactus Valley Ditch	5466.0	5466.5	5466.9	5467.1	5467.5
				64	178	250	463
3978	75+40		5473.2	5474.2	5474.7	5475.0	5475.5
				64	178	250	463
3980	81+00		5487.5	5488.6	5489.4	5489.8	5490.8
				64	178	250	463
3982.1	81+58		5485.3	5490.1	5494.3	5494.5	5494.8
				107	353	488	899
3982.2	81+82	Road	5485.3	5493.2	5494.6	5494.9	5495.3
				107	353	488	899
3984	83+10		5493.0	5494.5	5495.4	5495.6	5496.2
				107	353	488	899
3986.1	83+65		5496.5	5500.4	5501.1	5501.3	5501.9
				107	353	488	899

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TABLE 1 FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA *

Cross Section Design-nation	Stationing from Mouth Feet	Identification	Stream Bed Elevation Feet	Crest-Elevation and Peak Discharge c.f.s. 10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
3986.2	84+25	County Rd 231	5496.5	5500.7	5501.5	5501.8	5502.4
				107	353	488	899
3988	84+70		5496.2	5500.8	5501.7	5502.0	5502.6
				107	353	488	899
3990	90+30		5507.5	5508.6	5509.8	5510.2	5511.4
				107	353	488	899
3992	98+90		5530.5	5531.7	5532.8	5533.3	5534.2
				107	353	488	899
3994	103+10		5539.0	5540.4	5541.4	5541.9	5543.0
				107	353	488	899
3996.1	103+72		5535.2	5541.2	5542.8	5543.4	5544.7
				107	353	488	899
3996.2	103+88	Private Rd	5535.2	5541.4	5543.3	5543.9	5545.4
				107	353	488	899
3998	104+50		5541.5	5543.1	5544.5	5545.1	5546.5
				107	353	488	899
4000	107+30		5549.5	5550.7	5551.8	5552.3	5553.4
				107	353	488	899
4001	121+30		5589.0	5591.6	5593.2	5593.6	5594.5
				107	353	488	899
4002	131+70		5617.8	5619.8	5620.9	5621.4	5622.5
				107	353	488	899
4003	136+30		5633.5	5635.6	5637.4	5638.2	5639.8
				107	353	488	899
4004.1	137+15		5635.6	5637.9	5640.7	5641.8	5644.4
				122	415	565	982

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TABLE 1 FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA *

Cross Section Design-nation	Stationing from Mouth Feet	Identification	Stream Bed Elevation Feet	Crest-Elevation and Peak Discharge c.f.s. 10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
4004.2	137+75	Road	5635.6	5645.3 122	5649.1 415	5649.4 565	5650.3 982
4006	142+20		5647.5	5648.7 122	5649.7 415	5650.1 565	5651.0 982
4007	147+80		5664.0	5665.7 122	5666.8 415	5667.2 565	5668.2 982
4008	151+80	Trib Confluence	5679.7	5681.0 115	5682.1 372	5682.4 501	5683.2 860
4009	157+40		5699.0	5700.1 50	5700.8 160	5701.1 215	5701.8 365
4010.1	157+70		5703.1	5707.9 50	5710.0 160	5710.0 215	5710.1 365
4010.2	158+10	County Rd 261	5703.1	5710.1 50	5710.1 160	5710.2 215	5710.3 365
4011	158+40		5710.0	5710.3 50	5710.6 160	5710.7 215	5711.0 365
4012	162+00	Upper Study Limit	5714.9	5716.2 50	5716.8 160	5717.0 215	5717.5 365

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TABLE 1 FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA *

Cross Section Design-nation	Stationing from Mouth Feet	Identification	Stream Bed Elevation Feet	Crest-Elevation and Peak Discharge c.f.s. 10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
4008	151+80	First St Watershed Tributary	5679.7	5681.0 115	5682.1 372	5682.4 501	5683.2 860
4013	160+60		5710.0	5712.0 66	5713.2 207	5713.6 277	5715.5 797
4014	170+20		5747.7	5748.2 66	5748.7 207	5748.8 277	5749.8 797
4015	179+20		5776.8	5778.2 66	5779.1 207	5779.5 277	5781.3 797
4016	191+60		5829.8	5831.2 66	5832.0 207	5832.3 277	5833.7 797
4017	204+80		5881.3	5882.4 66	5883.3 207	5883.7 277	5885.7 797
4017.4	205+60		5892.8	5898.2 66	5900.5 207	5900.6 277	5901.2 797
4017.5	206+05	County Rd 228	5892.8	5900.7 66	5900.8 207	5900.9 277	5901.8 797
4018	207+60		5896.0	5900.9 20	5901.0 64	5901.2 86	5902.3 143
4020.1	210+60		5820.5	5922.1 20	5925.4 64	5925.6 86	5825.8 143
4020.2	211+00	County Rd 250	5920.5	5922.7 20	5925.6 64	5925.8 86	5926.0 143
4022	212+20	Upper Study Limit	5922.0	5923.4 20	5925.8 64	5925.9 86	5926.2 143

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TABLE 1 FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA *

Cross Section Design-nation	Stationing from Mouth Feet	Identification	Stream Bed Elevation Feet	Crest-Elevation and Peak Discharge c.f.s. 10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
481#	0+00	Colorado River at West Watershed	5383.6	5393.1 30200	5393.1 30200	5393.1 30200	5393.1 30200
4978	14+60	West Watershed	5392.0	5394.9 169	5395.0 463	5395.0 633	5395.0 1032
4980	18+40		5399.8	5401.1 169	5402.2 463	5402.7 633	5403.5 1032
4986.1	18+60		5409.8	5412.2 169	5414.4 463	5415.5 633	5417.7 1032
4986.2	21+00	Denver & Rio Grande Western R.R.	5409.8	5412.4 169	5415.0 463	5416.2 633	5418.6 1032
4988	21+30		5409.5	5413.4 169	5416.8 463	5418.4 633	5421.7 1032
4990	29+50		5434.0	5436.8 169	5438.2 463	5438.7 633	5439.7 1032
4992	39+20		5467.1	5468.0 169	5468.8 463	5469.1 633	5469.8 1032
4994.1	39+50		5467.1	5468.3 169	5468.7 463	5470.0 633	5472.7 1032
4994.2	40+30	Road	5467.1	5469.3 169	5477.5 463	5487.0 633	5490.6 1032
4996	40+50		5469.4	5470.4 169	5477.9 463	5487.3 633	5491.0 1032
4998	51+70		5492.8	5494.8 169	5495.9 463	5496.3 633	5497.2 1032
5000	64+10		5521.5	5523.4 169	5524.6 463	5525.1 633	5526.1 1032

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Discharge in Colorado River at 25 year frequency

TABLE 1 FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA *

Cross Section Designation	Stationing from Mouth Feet	Identification	Stream Bed Elevation Feet	Crest-Elevation and Peak Discharge c.f.s. 10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
5001	73+90		5547.0	5549.2	5550.3	5550.7	5551.6
				169	463	633	1032
5002	84+30		5576.0	5577.8	5578.6	5579.0	5579.7
				175	477	638	1030
5003	93+10		5595.6	5597.1	5598.1	5598.5	5599.3
				175	477	638	1030
5004	101+10		5617.5	5618.9	5619.6	5619.9	5620.3
				175	477	638	1030
5005.1	101+30		5617.0	5620.1	5623.0	5624.3	5626.9
				175	477	638	1030
5005.2	101+60	County Rd 233	5617.0	5620.5	5625.3	5626.1	5632.1
				175	477	638	1030
5006	101+80		5619.0	5621.8	5626.9	5628.5	5632.1
				175	477	638	1030
5007	111+00		5645.0	5446.4	5647.1	5647.3	5647.7
				175	477	638	1030
5008	119+80		5665.8	5667.1	5667.8	5668.1	5668.5
				175	477	638	1030
5009	129+40		5691.7	5693.5	5694.5	5694.9	5695.5
				202	529	690	1052
5010	138+60		5713.0	5714.7	5715.8	5716.2	5716.9
				202	529	690	1052
5011	147+20		5738.7	5740.0	5740.7	5740.9	5741.4
				71	206	275	391
5012	159+00		5744.3	5775.6	5776.2	5776.4	5776.8
				71	206	275	391

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TABLE 1 FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA *

Cross Section Design-nation	Stationing from Mouth Feet	Identification	Stream Bed Elevation Feet	Crest-Elevation and Peak Discharge c.f.s. 10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
5013	170+40		5814.0	5814.8	5815.3	5815.4	5815.7
				71	206	275	391
5014	179+20		5839.1	5840.5	5841.3	5841.7	5842.2
				71	206	275	391
5015	183+20		5855.0	5856.4	5857.4	5857.8	5858.4
				71	206	275	391
5016.1	183+65		5857.5	5861.4	5862.3	5862.4	5862.5
				71	206	275	391
5016.2	184+25	County Rd 237	5857.5	5863.3	5862.5	5862.6	5862.7
				71	206	275	391
5017	184+45		5862.1	5863.2	5863.7	5863.9	5864.2
				71	206	275	391
5018	194+05		5890.0	5890.9	5891.2	5891.4	5891.6
				50	114	144	221
5019	203+05		5928.0	5929.3	5929.9	5930.0	5930.4
				50	114	144	221
5020	211+25		5966.2	5967.3	5967.7	5967.9	5968.2
				50	114	144	221
5021	219+45	Upper Study Limit	6004.0	6004.9	6005.2	6005.3	6005.6
				50	114	144	221

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SOIL CONSERVATION SERVICE